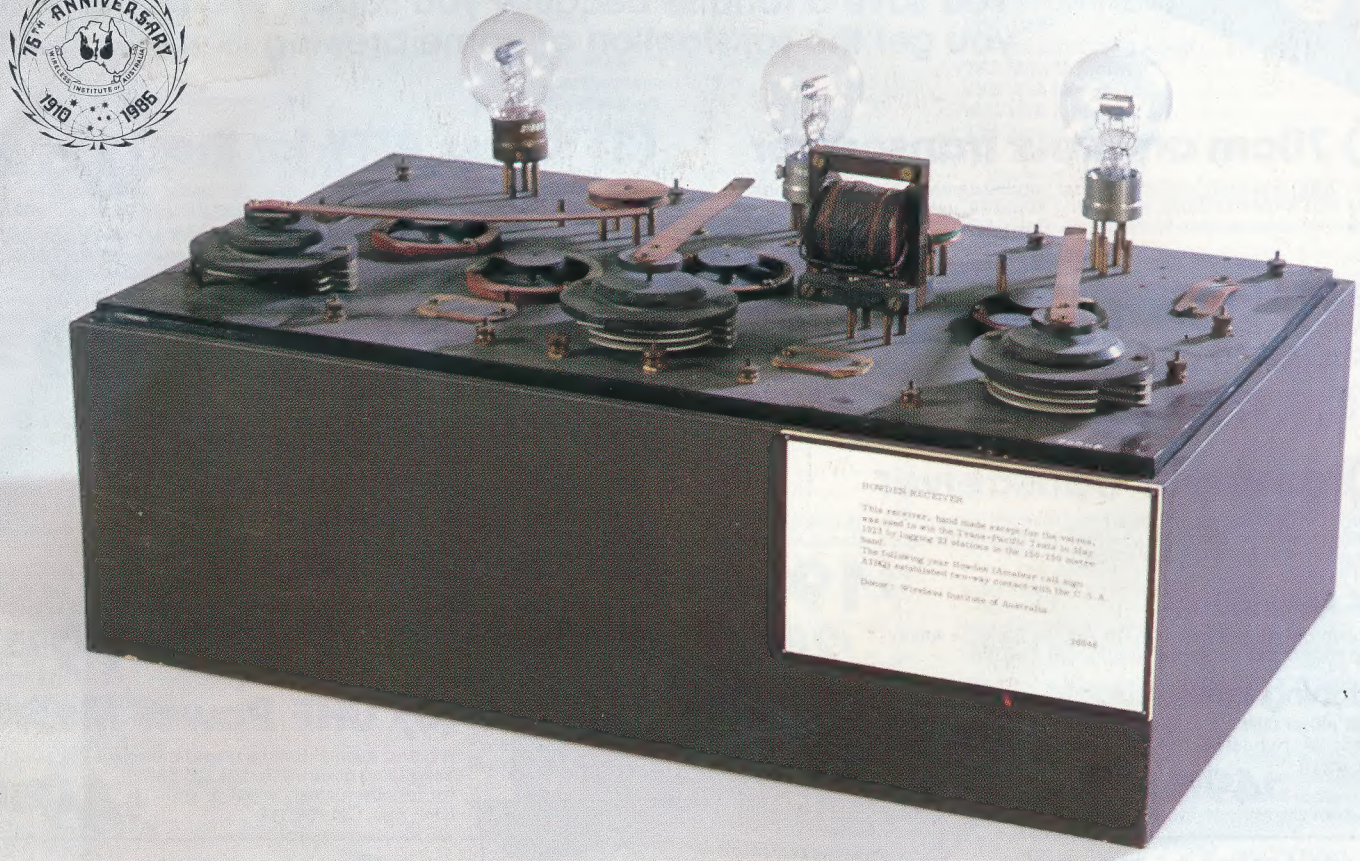
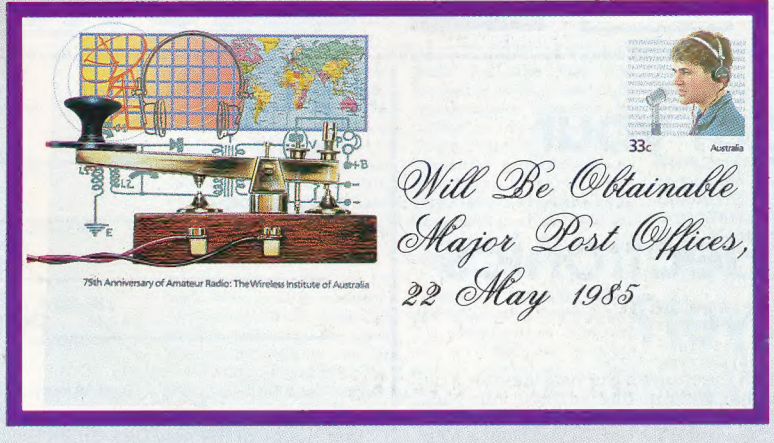
AMATEUR RADIO

VOL. 53, No. 5, MAY 1985

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA





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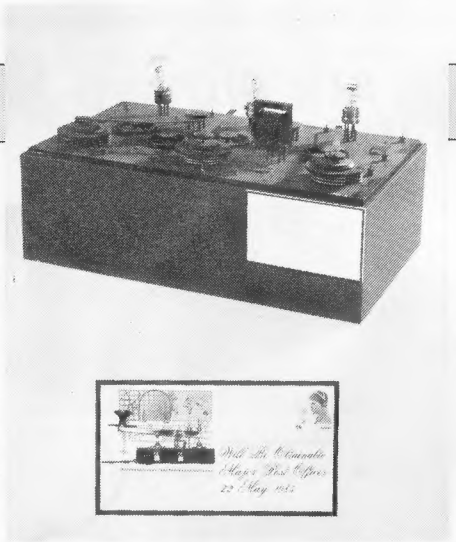

Photograph by Ken McLachlan VK3AH

Max Howden's Receiver. The inscription reads — This receiver, handmade except for the valves, was used to win the Trans-Pacific Tests in May 1923 by logging twenty-two stations in the 150-250 metre band. The following year Howden (amateur call sign A3BQ) established two-way contact with the USA. Inset: Australia Post's Stamped Envelope, commemorating the WIA's 75th Anniversary, which will be available from major Post Offices on 22nd May 1985.

Grateful thanks for help and co-operation is extended to Chris Long and Frank Coffa of Melbourne Scientific Museum.

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This month the magazine features a reminiscent article by Ian VK2KU, p.13. Ian recalls how he became interested in amateur radio in the late 1910s. Ian and his science master attempted to make wireless telegraphy contact between Tingha and Inverell and by the time they concluded their tests Ian was well and truly hooked on the hobby.

Also of historical interest are two photographs, one is of a class of radio students in 1928-29, p.12 and the other is a Short Wave Tuner which was made in 1918, p.7.

Graham VK5AGR has written an informative article about his trip seeking first-hand information about amateur satellites p.24. Graham visited the US, England and Germany and has gathered a wealth of information of what is happening with current satellites and what can be expected in the future.

For the home-brewer there is a delightful article explaining the construction of an "Afterburner" for 14MHz RTTY p.9. John VK3PL, writing his first technical article, takes the constructor through all the stages to the final product of this inexpensive unit.

Having trouble with the electronic flashers on the car when you are transmitting? Rodney VK3UG may have the answer then, p.17, as he explains how he overcame this problem with a couple of ceramic capacitors.

On the contest scene Ian VK5QX gives a full description of contesting for the newcomer. Ian explains how simple most contests are and emphasizes the hardest part of any contest is to read the rules and follow them to the letter.

On page 5 there is a brief, interim report of the Readership Questionnaires.

(BKP)

DEADLINE

All copy for July 1985 AR (including Hamads, columns) must arrive at PO Box 300, Caulfield South, Vic. 3162 at the latest by midday, 23rd May 1985.

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Hamads should be sent direct to same address.

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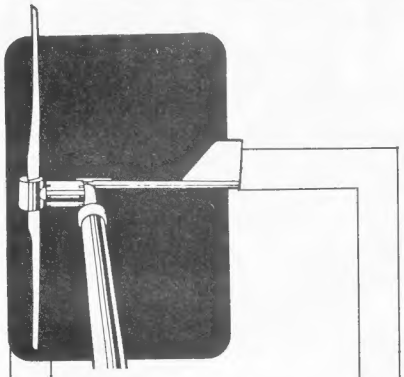

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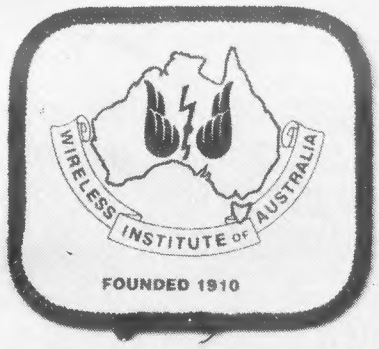

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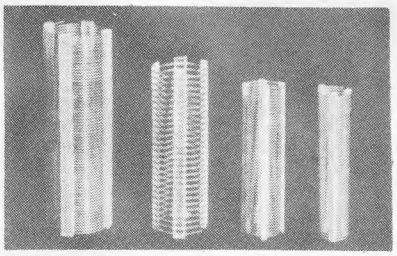

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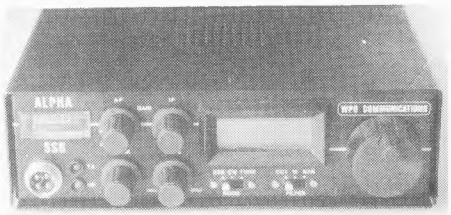

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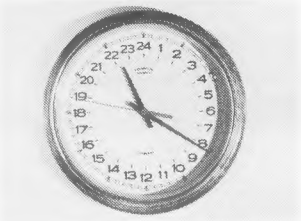

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Characters	Alphabet, Figures, Symbols, Special Characters
Speed	Morse Receiving: 5-100 Words/Minute (AUTOTRACK) Transmitting: 5-100 Words/Minute RTTY (Baudot, ASCII & JIS) 12-300 bauds TTL (Baudot, ASCII & JIS) 12-600 bauds ARQ/FEC 100 bauds
Input	AF Input Impedance: CW and RYYT 75 ohms TTL Level Input: common to CW, RTTY ASCII & JIS
AF Input Frequency	CW: 830 Hz RTTY (Baudot, ASCII, JIS): Mark 1275Hz (Low Tone), 2125Hz (High Tone) Shift 170Hz, 425Hz, 850Hz + fine tuning AMTOR (ARQ/FEC): B 1785Hz, Y 1615Hz [CCIR 476-2] + same frequencies as RTTY
Output	Keying Output: CW . . . 80mA, 200V (Optoisolator) FSK . . . 80mA, 200V (Optoisolator) AFSK Output Impedance: 600 ohms (Common to CW, RTTY)
AFSK Output Frequency	CW: 830Hz RTTY (Baudot, ASCII, JIS): Mark 1275Hz (Low Tone), 2125Hz (High Tone) Shift 170Hz, 425Hz, 850Hz AMTOR (ARQ/FEC): B1785Hz, Y 1615Hz [CCIR 476-2] + same frequencies as RTTY
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Display Output	5-inch High-resolution green monitor built-in Composite Video Signal Output impedance: 75 ohms
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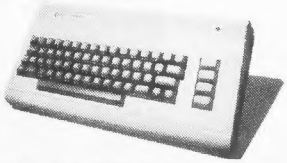

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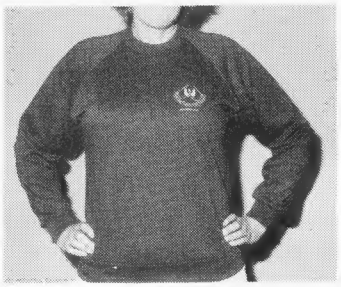

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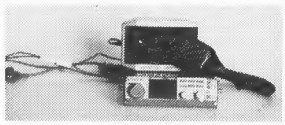

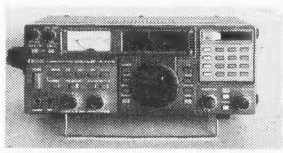

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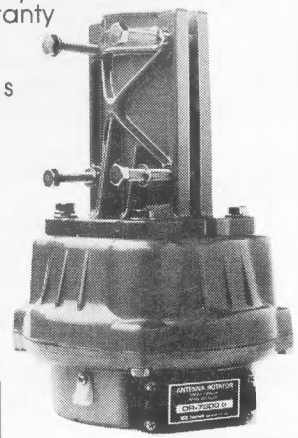

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a word from your EDITOR

COMING TOGETHER

As I write this, in the middle of March, the main item on the Institute's horizon is the Federal Convention at the end of April. So as a change from the editorial history and prophecy of the last few months it seemed that a little Convention history might be worthwhile.

The Convention is an annual event at which the Executive, responsible for managing the WIA from day to day, meets its Board of Directors, the Federal Councillors from all the Divisions.

Although this is the Institute's 75th Anniversary Year, for much of its life it was a small enough organisation to manage with a minimum of Federal-State liaison. The first Federal Convention was in 1924, and was held thereafter in a different capital city each year. In some years no Convention was held, and of course like amateur radio itself the WIA was effectively in suspension during the 1939-1945 war. This will be the 49th Convention in 62 years.

As the Institute grew, the Executive of necessity became larger. In 1972 the Federal body took over the responsibility from the Victorian Division for the publication of AR, which had become too much for one division to handle. This coincided with the appointment of our first salaried full-time business manager, the late Peter Dodd VK3CIF. Since 1975 the Federal Convention has been held in Melbourne, as it is easier and cheaper to bring about fifteen people to Melbourne than it would be to move the same number plus all Executive officers elsewhere. Irrespective of the Convention locale, only the host Division's councillors would not need to travel.

Hopefully, these paragraphs may help to explain, particularly to younger members, how the WIA is organised. The intention is to give all members, irrespective of their location, an equal voice in the Institute's representation of amateur radio to community and Government.

From time to time we hear of amateurs who refrain from joining the WIA, or even resign from it, claiming that their opinions or wishes would be or have been ignored. Perhaps this can happen sometimes. No system is perfect, and amateurs tend to be rather individualistic. Some, believe it or not, might even be a little eccentric! But one thing is certain, the non-member's voice will be ignored almost always; the member's very rarely, and then either by mistake or for good reason. If you are a non-member, reading a borrowed copy of AR, why not join us and let your voice be heard?

Bill Rice VK3ABP
Editor

SOME ANSWERS FROM THE READERSHIP QUESTIONNAIRE

Earl Russell VK3BER.

AR
☐ **Yes** ☐ **No**
☐ **100%** ☐ **80%** ☐ **50%** ☐ **5%**
Call **Book**
☐ ☐

Remember the questionnaire you received with your WIA subs renewal notice? Some preliminary results are now available from the computer analysis. Your opinions of AR magazine will be of greatest interest to the editor and the publications committee so I will give those first.

Generally the magazine is well received but you cannot please all of the people all of the time and still stay within budget; 56 percent say AR is good, 26 percent say it is excellent, 14 percent satisfactory, 3 percent poor and about 1 percent have no opinion to offer. The presentation of the magazine received similar percentages. 88 percent of readers consider the length of articles "about right". The most frequently read regular articles were the Editorial and WIA News, both about 80 percent, whilst the least read were Contests and Awards, both at 25 percent (that still represents a regular readership of over 2000). From these figures it would appear that members are interested in Institute matters but they do not have a great competitive spirit.

The readership of the other regular columns varies between 40 and 60 percent except for Equipment Reviews and Historical Articles which interest 65 percent. 17 percent of members magazines are also read by non-members. Encourage these people to join the WIA so they can receive their own copy of AR and save wear and tear on yours, but more importantly, a significant increase in membership will result in an overall decrease in fees as fixed costs will be spread across a greater number of members.

The Call Book also came under scrutiny; 43 percent have not seen the latest issue yet, but of those who have, 30 percent regard it as excellent, 54 percent good, 14 percent average and the remaining 2 percent consider it poor. Almost half buy each issue of the Call Book.

Hamads have been used by 15 percent to dispose of pre-loved equipment and 21 percent have bought items from Hamads. The commercial advertisements are normally read by 82 percent while 59 percent have purchased equipment as a result of having seen it advertised in AR and 36 percent have made their purchases after reading the Equipment Reviews.

Antenna articles are the most popular (a whopping 90 percent) followed by construction articles (81 percent). It looks as if home brewing is definitely not a thing of the past; well we at least like to read about it. 60 percent claim to build a quarter of their equipment, 21 percent do not build anything and about 1 percent build all their equipment. The remainder build between half to three quarters.

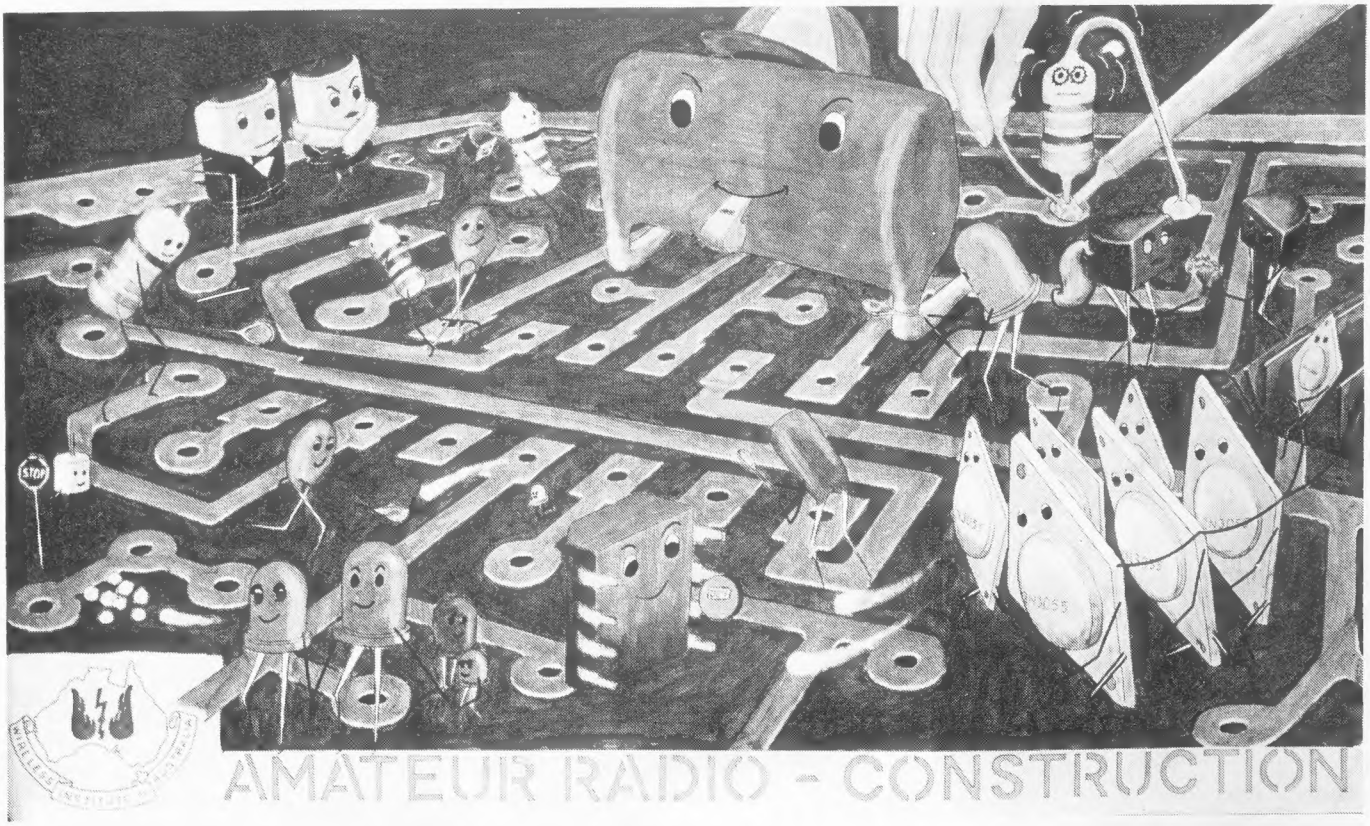
The time and inclination to get on air naturally varies. 45 percent spend 1 to 5 hours a week operating, 20 percent for less than 1 hour and also for 6 to 10 hours. There is a lucky 15 percent who are able to spend more than 10 hours each week communicating with other amateurs. Future analyses will enable us to see which age groups are able to spend the greatest and least times on air.

From the statistics so far only 1 percent of the membership of the WIA is below the age of 20. This the International Year of Youth, let us aim to introduce more young people to the hobby to ensure its perpetuation. The WIA bookpacks are aimed at interesting secondary school children in amateur radio. Another 1 percent declined to indicate to which age group they belonged (our female members?). Only 8 percent of members are in the 21-30 age group, 20 percent are 31-40, 18 percent 41-50, 23 percent 51-60 and 29 percent are over 60 years old.

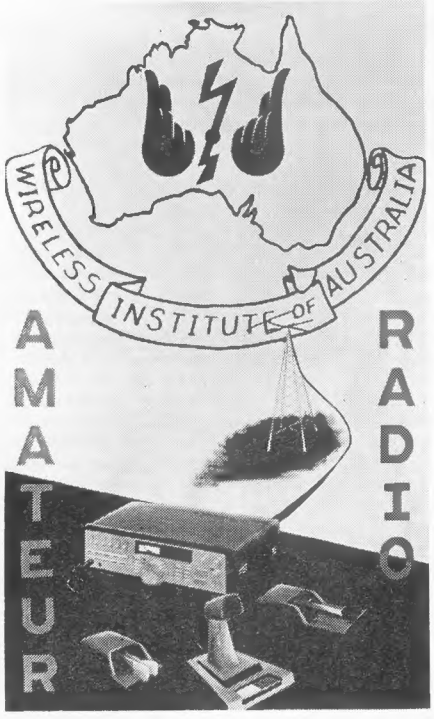
The on-air operating preferences ranged from 45 percent ragchewing to 3 percent whose main interest was participating in contests while in between were the 31 percent whose main pleasure is chasing DX. Operating modes used are SSB (80%), FM (44%), CW (27%), RTTY (19%), SATELLITES (10%), QRP (9%), AM (6%), ATV (4%), SSTV (3%), PACKET (2%) and EME a small fraction of a per cent. The bands on which these modes are used are HF (55%), VHF (49%), UHF (18%) and MICROWAVE (2%). The mathematicians will already have calculated that the above sets of figures total more than 100 percent, but before dashing off letters to the editor, may I point out that many replies listed more than one band or mode used.

Thank you to all members who returned their questionnaires, the response was far greater than one staff member predicted — he lost his bet — but is yet to provide lunch. When all the replies have been processed we will know the exact percentage return, but it appears to be around 80 percent. The work of inputting the data is still continuing as it is being done on a part time basis between other office duties. The tedium of entering the information is often relieved by the humorous comments written on the questionnaires. These will be the subject of a future short article or fillers in AR. **AR**

WIA Seventy Fifth Anniversary News



Posters on this page were contributed by Vicki Marsden VK2EVM.

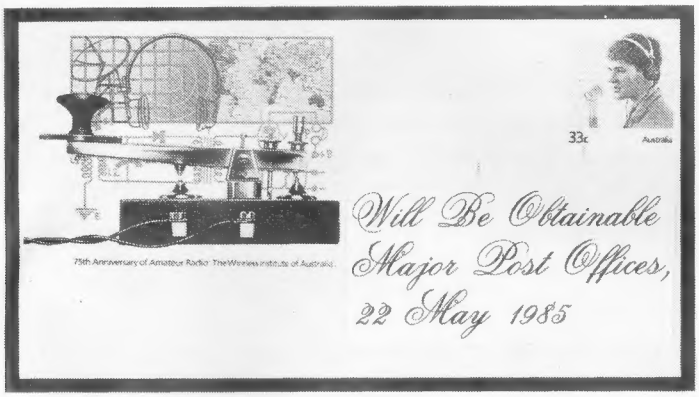


POSTER COMPETITION

The entries have now closed for this competition. The Federal office has received some very promising artwork from members. The judging will take place during the next meeting of the Anniversary sub-committee and the results published in a later edition.

PRE-STAMPED ENVELOPE

Members are reminded that Australia Post will be issuing this envelope on 22nd May. If you require envelopes for your friends overseas, you are advised to obtain your supply early.



NATIONAL FOXHUNTING CHAMPIONSHIP

The rules for this event will be published shortly, at this time discussions are taking place between the VK1 and VK2 Divisions as to the best venue. This is likely to be the Wagga convention held October. Firm details will be published as soon as possible.

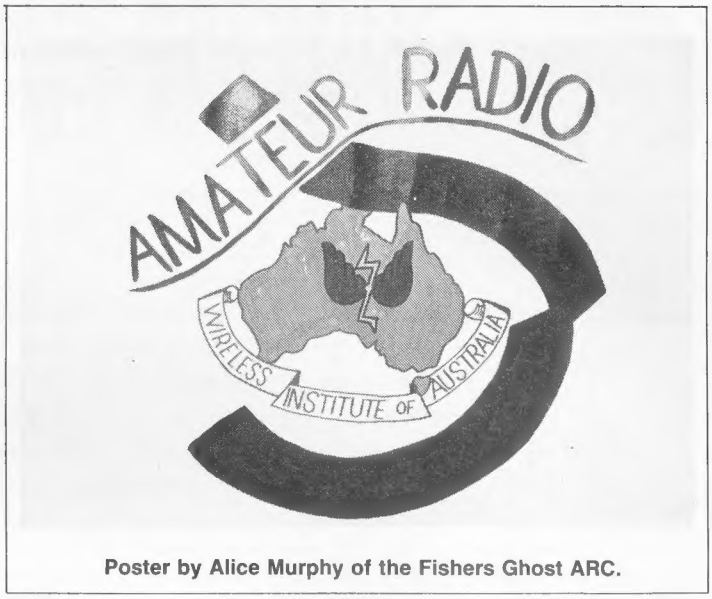
The prizes for this event have been finalised. There will be a large annual trophy with replicas for the winning team. Icom (Aust) have donated a handsome piece of equipment for this 75th Anniversary Year, which will be presented to the winners. This has been followed by a further gift from GFS Electronic Imports of an interesting piece of VHF/UHF equipment, which will help make this event a high note of this special year.

DO YOU OWN A PIECE OF HISTORY?

In reply to this question in January's 75th Anniversary column we have received information about a "Short Wave Tuner Mk 3" owned by Peter Thomas VK5ZPT.

Photograph by David Clegg VK5AMK.

Short Wave Tuner Mk3 owned by Peter VK5ZPT.



Poster by Alice Murphy of the Fishers Ghost ARC.

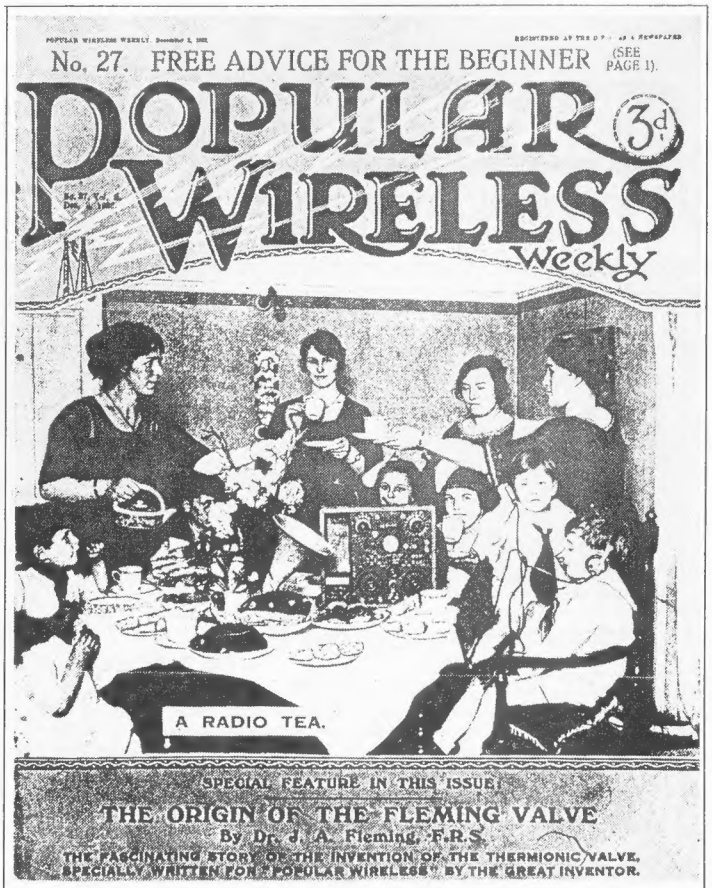
The unit was made in 1918 by "ATM Co Ltd", England and is in perfect working order. It is essentially a self-contained crystal receiver housed in a mahogany case covered with canvas and measures 12x14x8 inches.

In 1918 the term "short wave" applied to any frequency of more than 500 kHz and the coverage of this unit is approximately 400-2000 kHz.

These units were sold for five guineas in England after WWI and were used by amateurs in the early 1920s when amateurs operated in what is now the broadcast band.

Has any other member any equipment older than this unit?

AR


No. 27. FREE ADVICE FOR THE BEGINNER (SEE PAGE 1).
POPULAR WIRELESS
3d.
Weekly
A RADIO TEA.
SPECIAL FEATURE IN THIS ISSUE:
THE ORIGIN OF THE FLEMING VALVE
By Dr. J. A. Fleming, F.R.S.
THE FASCINATING STORY OF THE INVENTION OF THE THERMIONIC VALVE, SPECIALLY WRITTEN FOR "POPULAR WIRELESS" BY THE GREAT INVENTOR.

A Photocopy of the cover of popular magazine, "Popular Wireless Weekly", 2 December 1922 featuring the Short Wave Tuner at 'pride of place' on the dining table.

WIA Seventy Fifth Anniversary

MAY 1985

SUN	MON	TUE	WED	THU	FRI	SAT
			1 3.540 1030UTC IW Net HL30HQ ceases (see P17 Apr) May Day	2	3 Polish Nat Day School Breakup—VK1 School Breakup—VK2	4 County Hunters SSB Test Florida QSO Party G QRP SSB Activity
5 Coral Sea Sunday County Hunters SSB Test Florida QSO Party G QRP SSB Activity	6 Labour Day—VK4 May Day—VK8	7	8 3.540 1030UTC IW Net Radio Hunt (see contests) VK3 AGM	9	10 School Breakup—VK3 School Breakup—VK6	11 Peace to World Test
12 Mother's Day Peace to World Test Rogation Sunday	13 VK75A begins VK5	14	15 3.540 1030UTC IW Net	16 Ascension Day	17 ITU Day Norwegian Nat Day School Breakup—VK5	18 ARI Internat Test Armed Forces Day—USA
19 ARI Internat Test	20 Adelaide Cup—VK5 School Resumes—VK1 School Resumes—VK2	21 DOC Exams	22 3.540 1030UTC IW Net Pre Stamp Envelope Release	23 AR Deadline for July VK5 Display at GPO	24 Queen Victoria's Birthday VK5 Display at GPO	25 CQ WW WPX CW Test
26 CQ WW WPX CW Test Pentecost VK75A ceases VK5 Whit Sunday	27 School Resumes—VK3 School Resumes—VK6	28 CLARA AC/DC Mystery VK5 Div Meeting	29 3.540 1030UTC IW Net CLARA AC/DC Mystery	30	31 School Breakup—VK7	

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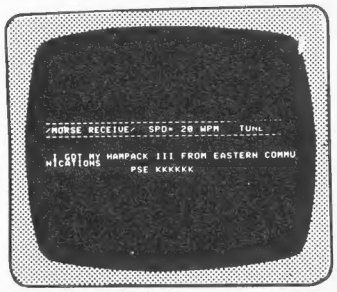
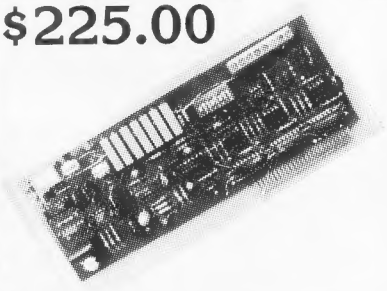


$225.00



HAMPACK III MODEM

Turn your APPLE II & IIE or compatible computer into a communications terminal. Send and receive Morse code, RTTY and ASCII at any speed from APPLE peripheral slot. Complete with software and instruction manual.

FEATURES ARE:

- ★ *10k receive buffer*
- ★ *10k transmit buffer*
- ★ *Split screen*
- ★ *Save buffers to disk*
- ★ *Retrieve text from disk*
- ★ *Brag statements*
- ★ *Auto CQ, ID, QTH, etc, etc.*
- ★ *Many other features too numerous to mention here*
- ★ *2125-2295 Hz + 1300-2100 Hz Tones (1200-2400) opt.*

EASTERN COMMUNICATIONS P/L

Vectorio PC16 Computer ***$1899***

SYSTEM — Two units: keyboard and main cabinet with processor and drives, monitor optional.

PROCESSOR — Intel 8088 (4.77 MHz), 128k RAM expandable to 256k with 64k increasment. Expansion card to 768k optional. Co-processor 8087 optional with socket.

OPERATING SYSTEM — BROM V.1.2
DIOS V.2.2
MSDOS 2.11 licensed by Microsoft Inc USA
Concurrent CP/M-86 licensed by Digital Research

INTERFACE CAPABILITIES — 5 expansion slots
RS-232C I/O on board
Parallel I/O on board
Floppy Disk controller on board
Color/graphic board provides high Res Composite, NTSC & RGB output, also light pen interface.

STORAGE DEVICES — 2 floppy disk drive, 5.25", half height, double density double side, 500kB unformatted, 327kB formated each. 2 spaces for optional floppy or hard disk drives.

KEYBOARD — ASCII standard typewriter keys, 10 function keys, special control keys, numeric keypad and 2 big ENTER keys.

POWER SUPPLY — 130W, switching type, cooling fan, 240V/50Hz. Able to drive two/floppy & two/hard drives.

MANUAL — Operational manual, MSDOS user's guide, DIOS V.2.2, Concurrent CP/M-86.

DEALER ENQUIRIES WELCOME

AR85

DELIGHTS OF HOME-BREWING . . . "THE AFTERBURNER"

John Isaac, VK3PL
540 Mount Dandenong Road, Kilsyth, Vic 3137

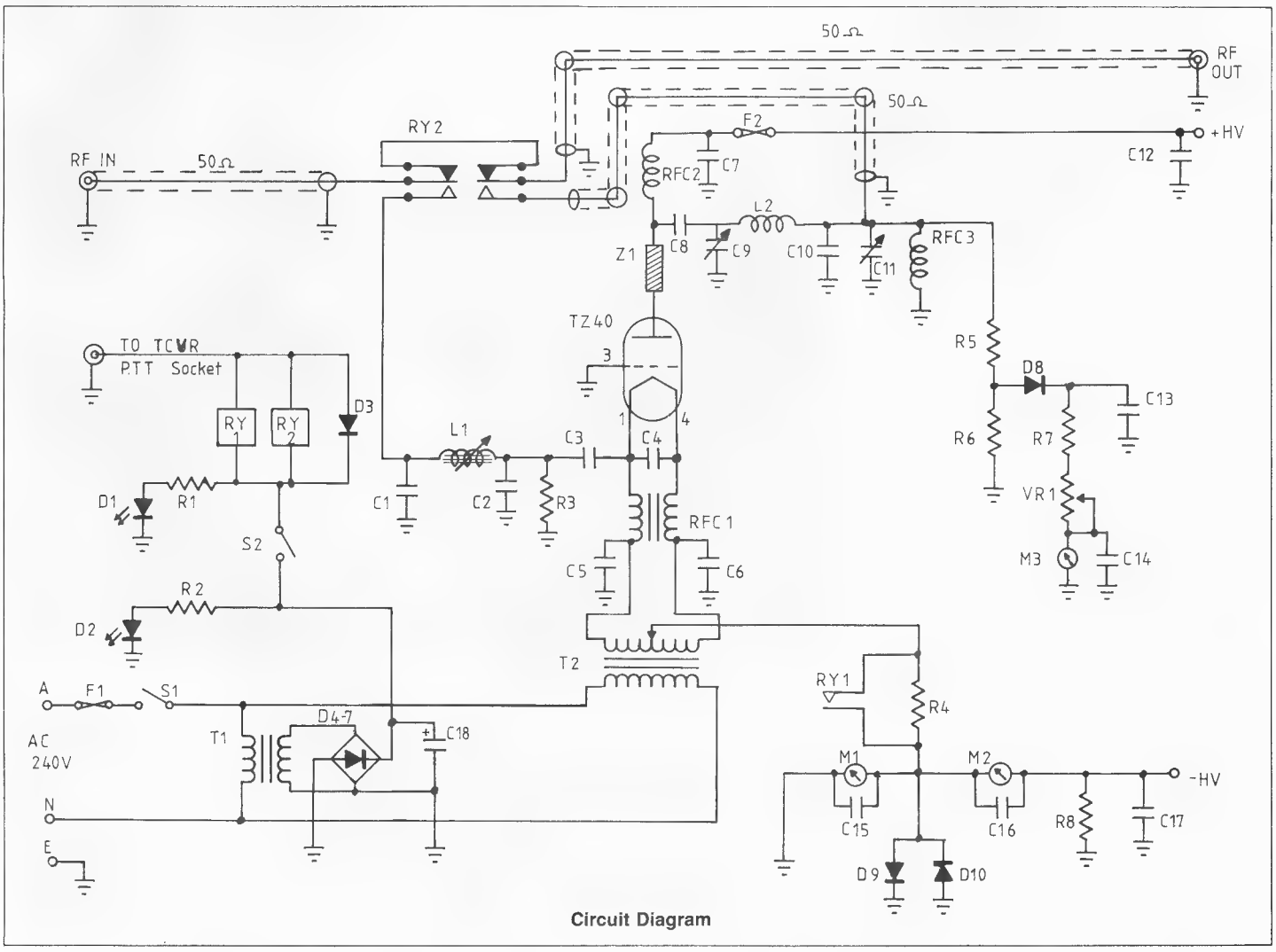
It was after a sixteen year lay-off from radio occasioned by the demands of the salt mine that semi-retirement allowed the writer's re-entry into this "king of hobbies and hobby of kings". A desire to return to the old favourite 14 MHz CW DX scene prompted the purchase of an FT101E transceiver and things looked good. The rehabilitation was proceeding smoothly, discovering what had been happening in the last decade or two . . . even understanding some of it. Then the RTTY bug bit.

The modern transceiver is a fine piece of equipment and the FT101E is no exception. However, their final amplifiers are designed for SSB/CW service and do not take too kindly to the 100 percent duty cycle imposed by RTTY, unless suitably derated. And the main point of interest was now 14 MHz RTTY DX (conditions permitting). The voices were calling *"What you need is a linear, mate"*.

It did not seem a good proposition to buy one, for one mode, one band. *"Better to build one. Let's have a look at the junk box"*.

Most of the parts needed were there . . . or else there was something which could be cannibalised, modified or otherwise fiddled with to suit the job.

It seems unlikely that anyone will duplicate this project exactly, but as a lot of researching was involved it was thought that to present the findings might be helpful to anyone contemplating a similar project. A lot of useful information (with lucid explanations) is available in Bill Orr's "Radio Handbook" (1). The ARRL "Handbook" also has some useful information and examples (2). "Solid State Design" gets thanks for showing how to calculate values for a pi-network (3). VK3XU's "Home Brew



Circuit Diagram

Linear" is an excellent article; this would be a good project for duplication (4). Also well worth perusing is the article by G3ISD: "A low budget HF linear amplifier" (5), which uses a pair of 813s, triode-connected.

THE CIRCUIT

It was decided to use an old TZ40 zero-bias Class B triode, which happened to be available, in the now popular grounded-grid circuit. Another good tube is the 813, triode-connected. If using a triode the high-mu ones are preferred; for other suitable tubes see (1) 7.23, 21.14, 21.18. There are a few advantages, and some disadvantage, in grounded-grid operation. Simplicity and reliability, self-neutralisation and the absence of bias and screen supplies in many cases make the circuit an attractive proposition.

The main disadvantage is that more drive is needed than for the same tube in a grounded-cathode circuit . . . This is not all lost, however; most of it *"comes out the other end"*. (1) 7.16-17, (2) 6.26.

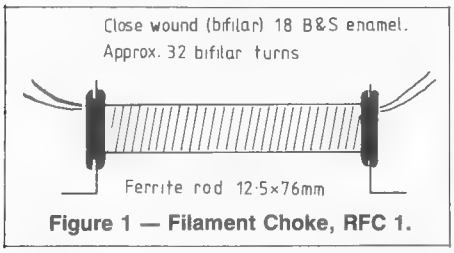


Figure 1 — Filament Choke, RFC 1.

The tube filament is at RF potential and must be isolated from the AC circuit for RF. A neat solution is an RF choke bifilar-wound on a ferrite rod (Figure 1). The plate choke is also home constructed, and has an inductance of about 95 uH, with a series-resonant frequency of around 25 MHz. (4) p 28, (2) 6.47. The tuned input circuit to the filament (cathode) allows the input impedance of the amplifier to be matched to the transceiver output.

RFC3 is a safety measure. In the event of C8 failing short-circuit the fuse in the HV supply line will blow.

Plate meter M2 is held near ground potential by R8, thus avoiding front-panel shock hazards. M1 and M2 are protected by D9 and D10 against gross overload in case of a flash-over or accidental short. The relative-power meter M3 is best adjusted to read about two-thirds scale at rated output. This circuit may be omitted entirely if an external power meter is used, but having the meter on the panel will be found convenient.

Relay RY2 switches around the amplifier during receive periods or when it is desired to use the transceiver "barefoot". RY1 removes the bias developed by R4 on switching to "amplifier in" (S2 closed). With S2 open, the amplifier is in "standby" condition. R4 may require experimentation for different tubes. Use sufficient to cut off plate current on standby.

POWER SUPPLY

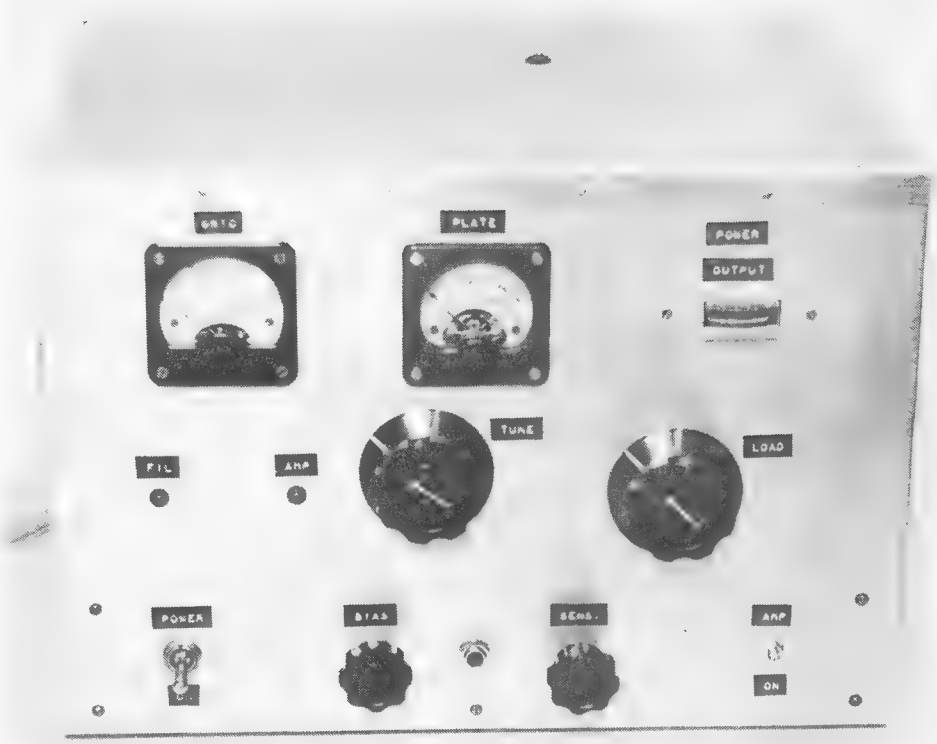
The high voltage power supply is an old home-brew unit using a pair of 866/866A mercury vapour rectifiers. It performs faultlessly and will probably outlast its owner. A modern solid-state unit (1) 23.1 to 23.42, (2) 5.2 to 5.21, 6.45, (4) 31 could be made smaller and lighter. The unit in use delivers 1 kV at 100 to 200 mA and at 100 watts is loafing along.

A 30-second time delay is fitted in the HV primary circuit to allow the rectifier filaments to heat before high voltage can be applied. With the metering circuit employed in the amplifier (meters "cold"), the negative terminal of the HV supply is NOT GROUNDED to chassis in the supply unit and only through safety resister R8 in the amplifier itself.

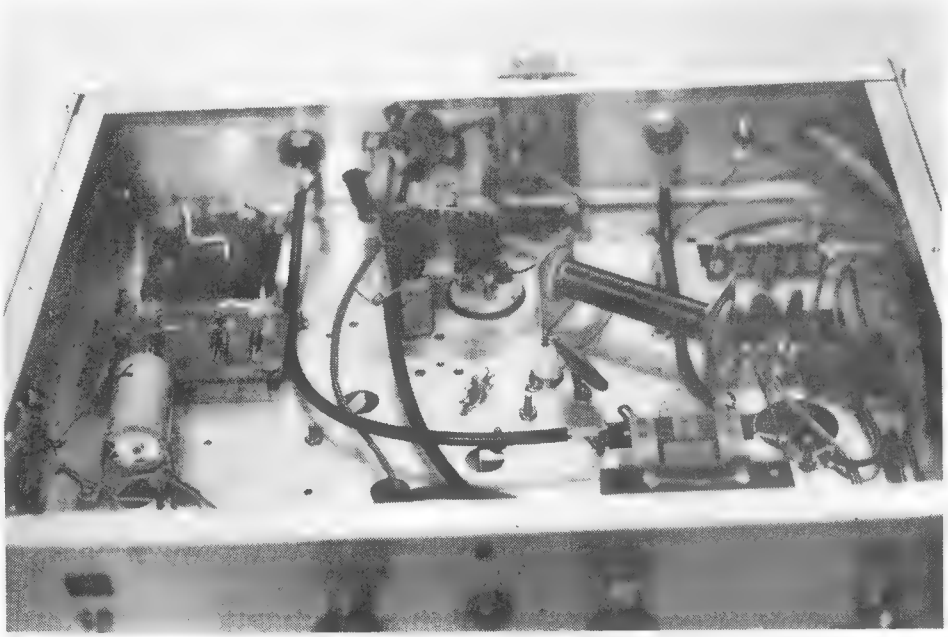
CONSTRUCTION

The amplifier was built on a chassis measuring 250 mm x 330 mm x 63 mm with a panel to suit tube height. Back, sides and top are enclosed by a shield made from perforated aluminium and aluminium angle.

Forced-air cooling has not been found necessary with the tube running at 100 to 120 watts input, but higher input or larger tubes would probably necessitate a fan or blower.



The Completed Unit.



Underside — an Internal View.

It is essential to shield the input circuit from the output. The tube socket is at chassis level, with the input circuit below chassis. The under-chassis section is completely enclosed by a sheet aluminium base.

The relays were junk-box items; provided contact size and spacing are sufficient their ratings are not critical as they are not called on to do any strenuous RF or DC switching.

RFC1, the filament choke, presented a slight problem. If the winding is done on the ferrite it will spring open when released giving a slack fit. Wind the turns on a tube or dowel a little smaller (say 11 mm for 12.5 mm ferrite rod). The coil is easily removed from the dowel and may be eased on to the ferrite by twisting against the direction of the winding so that the coil is opened slightly. Mechanical and electrical insulation between core and coil was provided by a layer of plumbers' PTFE thread sealing tape. A few coats of varnish or coil dope were applied to hold all in place. If loose the windings will hum when AC is applied. One way of supporting the finished article using two large grommets and a pair of brackets is shown in Figure 1.

RFC2, the plate choke, may be finished with a couple of coats of clear Dulux or similar. Winding details are given in Figure 2.

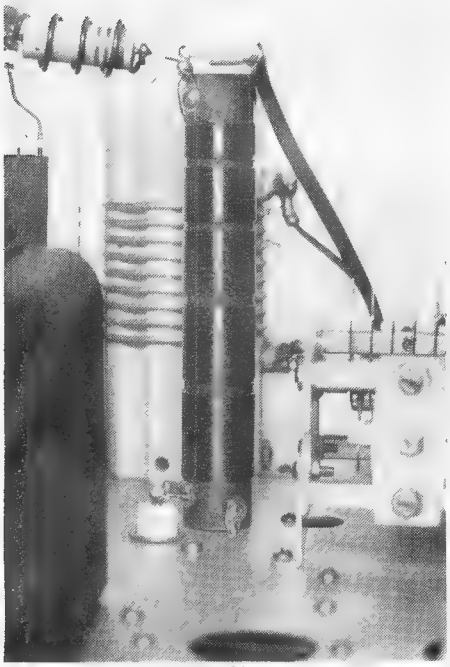


Plate Choke.

The plate cap connector was made from a piece of copper strip 1 cm wide, and is secured by a very small bolt and nut. Brass strip could make the bolt unnecessary. Copper strip was also used for the plate/output tank connections (7 mm wide in this case).

The cathode circuit is best mounted on the rear skirt of the chassis if layout will allow, for ease of access to the slug adjusting screw. If mounted on the chassis surface, a grommet-lined opening in the top of the cover will allow safe adjustment with the cover in place. A suitable tool is easily made (see the XYL for a plastic knitting needle).

ADJUSTMENT AND TUNING

This subject is well documented (1) 21.17, 22.17, 22.23, 22.44 and (2). However, an outline is presented here for guidance.

After a thorough wiring, check the amplifier is connected to the exciter (transceiver) and a suitable dummy load. An SWR meter in the output line is recommended. Input and output circuits may be resonated at the centre of frequency of interest with a dip meter.

With all interconnections in place and the high voltage supply OFF, filament and relay supplies are turned on (S1). High voltage may now be applied after any required warm-up period.

Plate tuning is set for approximate resonance and C11 near full mesh. With the amplifier "in line" (S2) and the transceiver carrier control at minimum, excitation is turned on and the excitation control advanced until a small flow of grid current is indicated.

The plate tuning capacitor (C9) is now rotated for the plate current "dip" indicating resonance. At this point output coupling can be increased by reducing the capacitance of C11 a little, tank resonance then being restored by adjusting C9. Advancing drive in small increments, gradually increasing output coupling (decrease C11) and re-tuning C9 in step, the amplifier is brought up to the desired level of power output, grid current and plate current. On tuning C9 through resonance, maximum grid current, minimum plate current and maximum output should now all occur at the same setting of the capacitor. (1) 21.19.

The input circuit may now be adjusted via the slug of L1, using an SWR meter in the input line to the amplifier, for minimum SWR. It should be possible to achieve 1.5 to 1 or lower.

A check for parasitic oscillations can now be made: with zero excitation and the amplifier fully activated (transceiver in CW mode, key up), C9 is swung steadily from maximum capacity to minimum, watching the plate current. This should show no variation over the full range of C9. Random variations in plate current or any show of grid current indicate parasitics. Changing the inductance of the suppressor Z1 . . . POWER OFF! . . . by springing open or compressing the turns is often all that is needed. If more or less turns are needed, the previous effort will probably show the way to go.

If all is well the SWR meter between exciter and amplifier can be removed after a final tweak at the desired frequency.

The signal may now be monitored in a nearby receiver (well shielded and with the antenna terminals shorted or grounded) with the RF gain backed right off. Keying the exciter with a rapid string of dots while tuning a few MHz either side of the signal should produce no clicks, pops or burps. Any of these may be a sign of residual parasitics; the carrier should be clean with solid make and break but no clicks.

NOTE It is imperative that the input signal to the receiver be adequately attenuated for this test, otherwise misleading results are almost certain. The amplifier is now ready for on-air trials. "Barefoot" operation is simply a matter of throwing S2.

This unit is a delight to use; it has been gratifying to note that stations contacted have been unable to distinguish between signals from the amplifier and from the transceiver when running at the same power level.

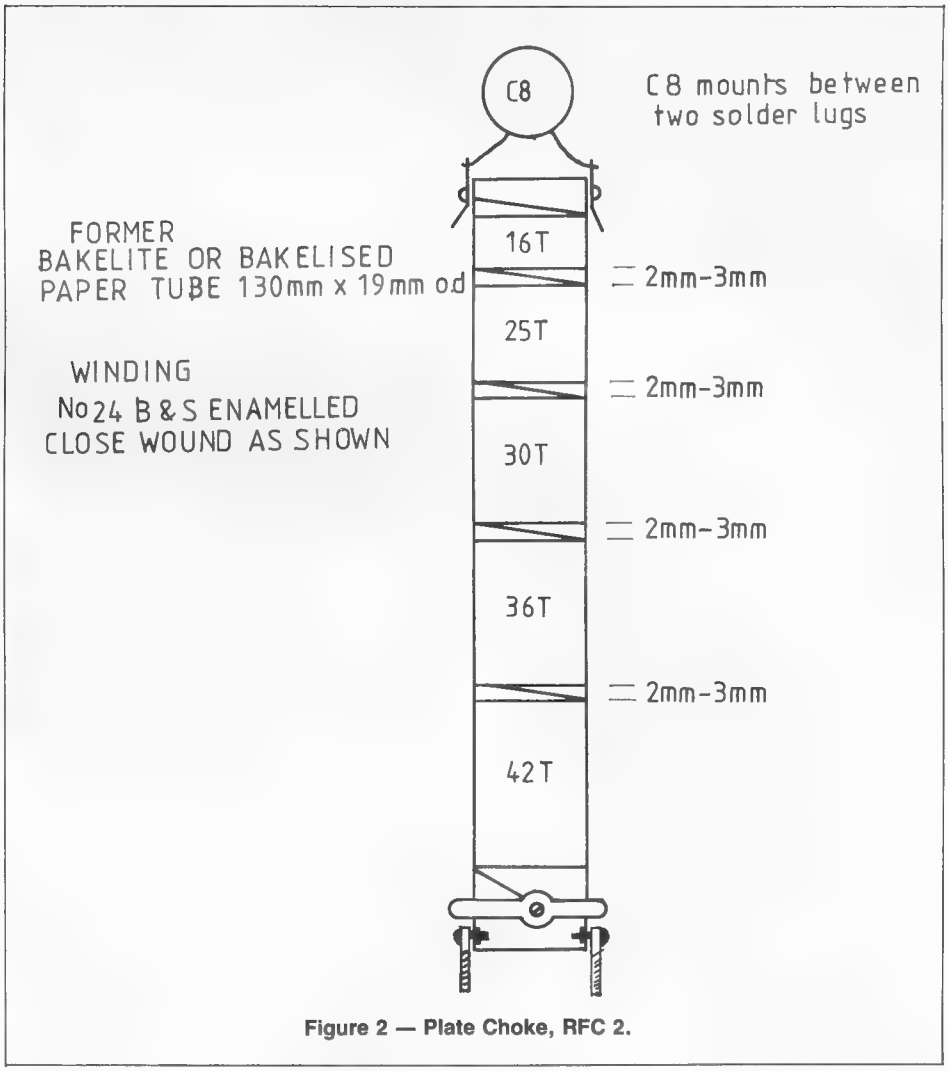


Figure 2 — Plate Choke, RFC 2.

THE FACTS OF LIFE

CONTACT WITH HIGH VOLTAGE CAN CAUSE SUDDEN DEATH, SEVERE BURNS OR SERIOUS INJURY.

AN AMATEUR INEXPERIENCED IN THIS TYPE OF WORK IS SERIOUSLY URGED TO ENLIST THE AID OF A FRIEND WITH THE NECESSARY EXPERTISE IN HIGH-VOLTAGE WORK BEFORE UNDERTAKING A PROJECT OF THIS NATURE.

The writer would like to express thanks to Drew VK3XU for the loan of reference material and the donation of some components, also to Ken VK3AH for the necessary encouragement and helpful suggestions on writing this article. Last, but not least, to a patient XYL.

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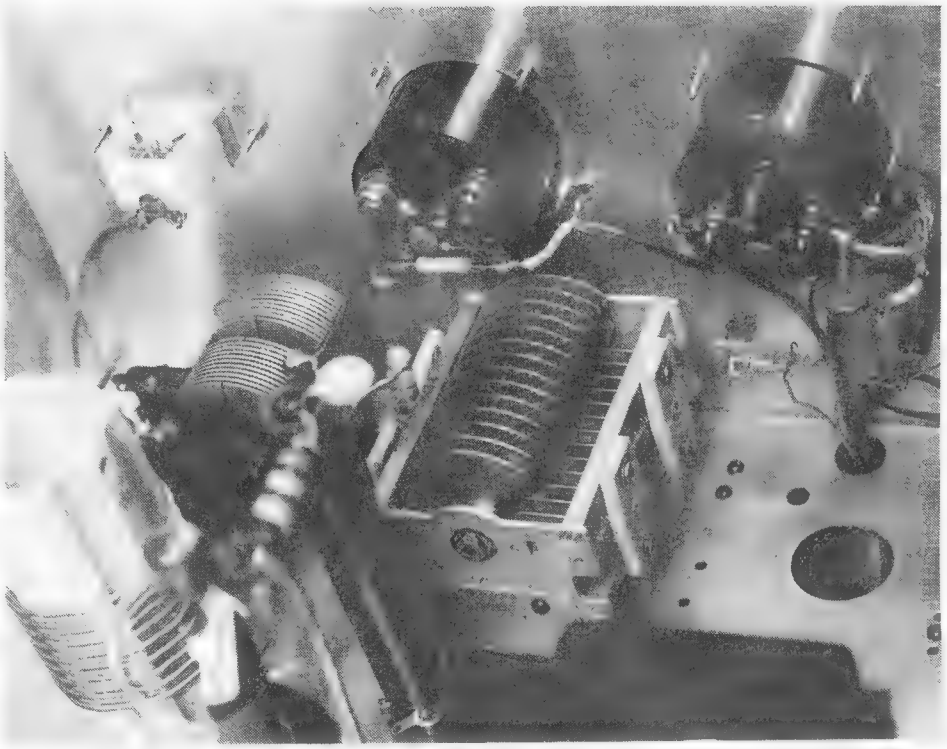
1 *William I Orr W6SAI. Radio Handbook, 20th ed.*
2 *ARRL. The Radio Amateur's Handbook, 1980.*
3 *Wes Hayward W7ZOI and Doug DeMaw W1FB. Solid State Design for the Radio Amateur.*
4 *Drew Diamond VK3XU. A Home-Brewer's Linear Amplifier. Amateur Radio, July 1981.*
5 *E J Hatch G3ISD. "A low-budget HF linear amplifier". Radio Communication, May 1982.*

PARTS LIST

R1, R2	560 ohm ½W
R3	3k 3W
R4	27k 2W
R5	10k 1W
R6	1k 1W
R7	10k ¼W
R8	175 ohm 4W (2 x 350R 2W w/w)
VR1	10k linear pot.
C1	680pF polystyrene 630V
C2	250pF mica (100 + 100 + 50)
C3, C5, C6, C17	0.01uF 630V disc ceramic
C13, C14, C15, C16	0.01uF 100V disc

C7, C12	0.01uF 1.4kV disc
C8	0.0022 6kV disc
C9	19/116 pF transmitting type (ex TU10B tuning unit)
C10	400pF 5kV test (ex TU10B)*
C11	2-gang BC capacitor, 400pF per gang *NOTE: C10 may be omitted if a 1200pF gang is available.
C18	2500uF 50V
D1	Red LED ("Amp. in")
D2	Yellow LED ("Power on")
D3	1N4002 etc
D4-D7	4 x 1N4002 or 50V 1A bridge
D8	1N914/4148
D9, D10	1N4007
F1	3AG fuse 1A
F2	3AG fuse 500mA
L1	0.67 uH approx 6½ turns 18 B&S spaced over 10mm. Inside dia 12.5 mm. Aegis "2000" assembly suggested.
L2	9 turns 10 B&S, 50 mm dia, 50 mm long on ceramic former (ex TU10B)
M1	0-40 mA (grid current)
M2	0-500 mA (plate current)
M3	0-500 uA (relative power). Inexpensive VU type suitable here.
RFC1, RFC2	see text
RFC3	2.5 mH pie-wound valve type
RY1	12V SPDT
RY2	12V DPDT antenna change-over (or use 2 SPDT . . . if mounted apart, use 50 ohm co-ax interconnection)
S1	SPDT ("Power on")
S2	SPDT ("Amp in/out")
T1	Pri 240V, sec 5V + 6.3V (old valve receiver type)
T2	Pri 240V, sec 7.5V 5A (home-rewound)
Z1	3½ turns 14 B&S enamelled on 100 ohm 2W resistor. Winding dia 12.5 mm; length 32 mm.

AR



WIA NEWS

INTERNATIONAL TRAVEL HOST EXCHANGE

Further to the article that appeared in the October 1984 issue of AR page 27.

The Federal office has received from the ARRL a list of participants to the above scheme. The list contains some 76 names and addresses of amateurs in 15 countries who have indicated their willingness to assist or in some instances accommodate visitors in those countries.

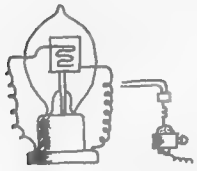
Any member who wishes to avail themselves of this service or who wishes to have their names included can obtain further information by writing to: The Secretary, WIA, PO Box 300, South Caulfield, Vic. 3162. AR

Photograph courtesy John Heaver VK3VNQ/3XEH

Class of 1928-29

Glen O'Shaughnessy
M. O'Neil
Rex Sullivan
Ken Crafter
Noel Fredricks
Harold Brown
Arthur Simms
John E. C. Heaver
Gilbert Savill

This photograph is a reproduction of a class of radio students at Mount Gambier High School in 1928-29. The class used the call sign OA5GH on 200 metres. Would this be the first school to conduct such teachings? An enlargement of this photo has been given to the Mount Gambier Radio Club (SERG) by John Heaver VK3VNQ/VK3XEH, one of the students in the class.



From Wireless Telegraphy To Amateur Radio

Ian Archibald VK2KU
15 Elizabeth Drive, Noraville, NSW. 2263

This is a personal history of my long association with the most intriguing of all hobbies. From the first letter of permission and a call sign of OA2EA to my current VK2KU call sign it has given me pleasure, some feeling of achievement, and friendship with other enthusiasts all over the world.

As not a great deal is known of those early days some sixty years ago when experiments were made with spark coils and loose-couplers, I will try to go into some detail as I remember it.

With the wealth of information on electronics available today it is hard to realise the difficulties the pioneer faced in his early experiments with "wireless". Apart from an elementary knowledge of the simpler laws of direct current, alternating current was a closed book. This was a world of horse drawn vehicles and bullock teams. As I rode to school the 26 km from my home near Tingha to High School in Inverell on my "one-lunger" — the type you pushed to start and then leapt on — I would pass waggons loaded with tin oxide, drawn by a team of perhaps thirty draught horses on their way from Tingha to the rail head in Inverell.

As there was no local supplier of the various bits and pieces the experimenter today finds so readily available our inductances had to be tuned by altering the number of turns in a coil. The rotary air spaced variable condenser was probably available to research laboratories but were practically unknown to the experimenter. This led to the design of the loose-coupler, a rather clumsy device but quite effective in a receiver. For tuning the transmitter where very high voltages were generated by a spark coil however it would require much modification. My attempts to make a tuning condenser for this purpose were not very successful!

INTERESTING TO COMMUNICATE BY WIRELESS

In 1919 I was 17 years old and my family lived in the country near Tingha. At that time Tingha was a big producer of tin oxide (cassiterite). Dredges and sluicing plants mined the aluvial flats and creek beds and the deep lead mines had extensive underground workings. My father was a Mining Engineer and managed a number of dredges and open-cut mines. I spent a good deal of my weekends and holidays in the engineering maintenance workshop.

At this time I was a 4th Year student at Inverell High School and rode a motor bike from home to school each day. Our science master, Mr H A Warden was an excellent teacher with many interests. My close association with him during the five year course for the Leaving Certificate gave me a good grounding in inorganic chemistry and it was early in my 4th year he suggested to me that it might be quite interesting if we could communicate by wireless telegraphy between his home in Inverell and mine near Tingha.

Before World War I Warden was teaching at the western town of Narrabri where he had built and operated an experimental wireless station. Now that conditions following the war were gradually returning to normal he was keen to resume experiments in wireless telegraphy. He explained to me that I would have to get permission from the authorities and that it might be difficult to find a source of supply of the various components I would need. He would give me sketches and diagrams and as much of the little known available information that he had. I am sure he could not have guessed that he was starting me on a lifetime enterprise for which I have always felt grateful.

PERMISSION RECEIVED

I sent a letter to the PMG's Department seeking permission to carry out experiments in wireless telegraphy. I was surprised to receive a reply from the Royal Navy stationed on Garden Island giving me authority to carry out these experiments. A short time after this I was notified by the PMG that I had been issued with the call sign of OA2EA.

WE SUPPLY ANYTHING

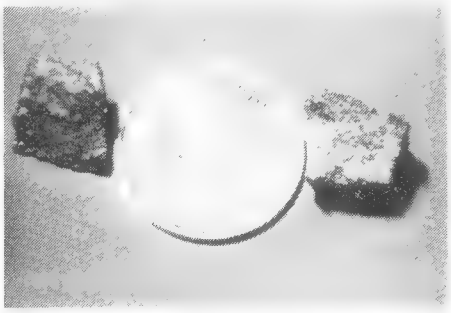
To get started on construction now called for the purchase of equipment and where to buy it at that time presented rather a problem. A study of Anthony Hordern's country catalogue, a large book about 51 mm thick conveyed the message that they could supply anything! An order posted to them for equipment confirmed their claim. When the parcels arrived by post they contained all the items I had ordered.

I now had a Western Electric headset with high resistance phones, a telegraph key, a buzzer with a couple of dry cell batteries, several reels of copper wire of different gauges with green silk insulation to enhance the appearance of the final job, several pounds weight of 34 gauge enamel cotton covered wire for the spark coil secondary and enough 22 gauge soft iron wire to make the core. In addition there were sheets of tin foil and waxed paper, paraffin wax, orange shellac and a good assortment of brass terminals.

SOUND, ATTRACTIVE PIECE OF EQUIPMENT

The loose-coupler was now the first unit to be made. Warden had suggested that I should take the time to make a sound and attractive piece of equipment as it would probably receive critical inspection from interested visitors. With this in mind I prepared a piece of red cedar by sanding and polishing it for the base and coil supports. Cardboard formers were used, the primary about 114 mm diameter by 127 mm long and the shorter secondary former a bit smaller in diameter so that it could slide easily in the primary coil. The primary core was then close wound with 22 DSC wire over about 102 mm and the ends secured and brought out for terminals. Before mounting a narrow track was made by removing the insulation to take a brass slider for tuning.

The secondary core was fitted with wooden end pieces bored to fit over two thin brass rods on which it would slide into the primary. In addition the outer wooden end piece was fitted with a switch arm and three studs so that the winding could be tapped for tuning. This former was now close wound with the DSC 28 gauge wire and connections made to the switch studs. Flying leads were added to make connections to terminals on the base board



Galena Crystals

To complete the receiver a holder was made for a small crystal of galena to be fitted with a "cat's whisker" and terminals for the phones were screwed to the baseboard. At a later date as a little "know-how" was acquired the galena-cat's whisker was replaced by a detector made by mounting crystals of zincite and bornite, the sulphides of zinc and copper, in small brass cups with Wood's metal. This made a very sensitive and stable detector.

NOW FOR AN ANTENNA

An antenna had now to be put up before the receiver could be tried out. A stringy bark pole about 9 metres long was put up in a corner of the backyard. A small pulley with a light rope was attached to hoist the end of the aerial. A copper wire was then run from the top of the mast to an insulator tied to a verandah post, thence to a butter box (a 304 mm cube) where several turns of the same wire were wound and thence to the loose-coupler primary. We had no information as to the wave lengths the commercial stations would be using but thought it would probably be in the 600 metre range. The idea behind the "butter box" coil was to increase the effective length of the antenna.

MORSE FOUND

An earth wire was run through a hole bored through the floor of the small verandah room. This wire was attached to the buried water pipe running from the tanks to the kitchen. With the aerial and earth wires attached to the receiver I was now ready to search for an incoming signal! After a good deal of time was spent in trying different settings of the loose-coupler and much fiddling with the cat's whisker a faint Morse signal was heard. With further alterations to the tuning of the loose-coupler, the reduction of the number of turns of wire on the "butter box", and some good fortune in finding and holding a sensitive spot on the galena crystal a strong Morse signal was received. My Morse at the time was not very good but I managed to read VIS and later a station with a different note, GBQ the Royal Navy station on Garden Island. This was very gratifying — the receiver was really working.

Before going on to the next project of transmitter and power supply I spent a good deal of time trying to improve my Morse. VIS seemed to transmit chiefly in plain English, GBQ in a five letter code, but both stations proved a wonderful source of good Morse for the beginner.

ON TO BETTER THINGS

The construction of the spark coil was fairly straight forward. Two pieces of board about 152 mm square and 13 mm thick with a 25 mm diameter hole in their centres were used to assemble the core and to give temporary support to the coil during construction. The soft iron wire was stretched to straighten it and cut into pieces about 254 mm long. After assembly with the wooden jig pieces kept flush with the ends the core was insulated with waxed paper and close wound with two layers of the 18 gauge insulated wire. The winding was secured, the wooden end pieces removed temporarily and the unit immersed in the paraffin impregnation pot.

After impregnation and cooling the wooden jig pieces were again fitted and the insulating tube between primary and secondary built up to a wall thickness of over 6 mm. In the first experimental coil made the insulation broke down between primary and secondary,

hence in this second attempt more care was taken to improve the insulation. Strips of brown paper were cut to fit neatly up to the end pieces. The paper was secured with cotton thread, the end jig pieces again removed and the unit immersed in the melted wax bath until no further air bubbles were seen. This method proved eventually to be quite successful.

The secondary of 34 gauge cotton enamel insulated copper wire was pie wound. The inner diameter allowed a smooth fit on the insulating tube, the pies were approximately 13 mm thick with an outside diameter of about 114 mm. The end pieces of the winding jig were slotted so that the pie winding could be secured with thread before removing from the jig for impregnation.

MAKE AND BREAK

The impregnated pies were assembled then on the insulated core with waxed paper interleavers so that the start of each winding could be brought out for ease in soldering. A polished cedar box had been made with the end pieces bored to support the core and to allow one end of the core which had been filed flat to slightly protrude. Before assembling in the box a condenser made from tin foil and cleaned photographic plates was fitted into the bottom of the box and leads brought out to shunt the make and break contacts of the primary winding. The make and break device or trembler used a clock spring armature with a soft iron disc rivetted to one end. The armature was also fitted with a heavy silver contact, and the adjusting screw also had a heavy silver contact.

Terminals were fitted to the top of the box for aerial and earth leads and to hold and allow easy adjustment of the spark gap. Terminals were also fitted to the end close to the vibrator for connecting the key and the battery leads. The spark coil was now ready for test.

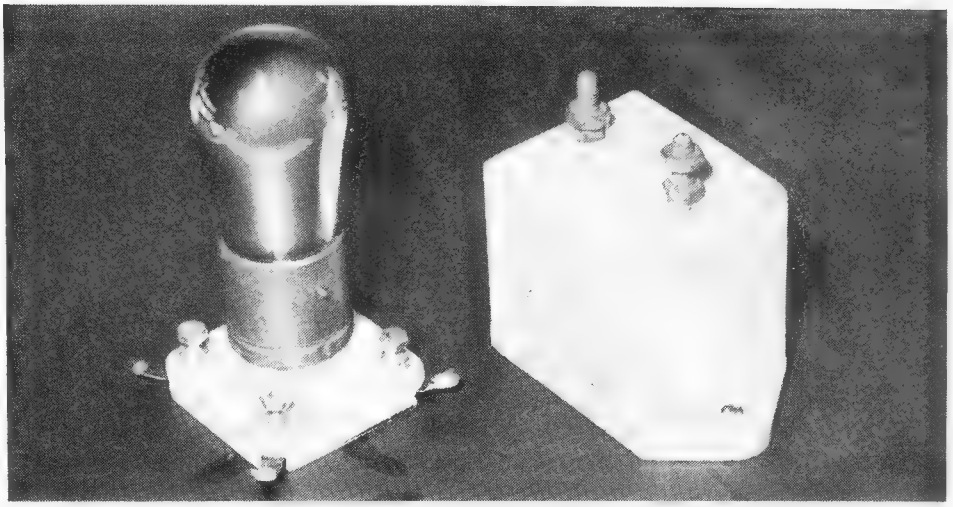
NO ELECTRICITY

Tingha at that time had no electric power service. Our home was lit by kerosene lamps. We used wood fires for cooking and heating. Tingha at nearly 914 metres above sea level could be very cold with occasional snowfalls. Firewood was in plentiful supply in the bush and the big log fires in the winter were very welcome.

Kerosene Lamps.

The primary battery power supply was made up from four wide mouth fruit preserving jars. These were fitted with wooden lids to support the electrodes and the lids were each bored with three holes to take the carbon arc rods and a centre hole for the zinc electrode. The zinc rods were cleaned and amalgamated and a simple lever system fitted to lift the zinc rods out of the electrolyte when not in use. The electrolyte was a saturated solution of sodium dichromate in dilute sulphuric acid. The battery was housed in a stout box with a carrying handle. It was rather messy and had to be handled with care.

The spark coil was now connected to the battery through the key and gave a hefty spark across the gap. Without a suitable meter I could only guess at the power input, as probably about two or three amps at about eight volts. By moving the receiver some distance away and listening to the coil output the burry note could be improved by reducing the spark gap and adjusting the vibrator. The resulting note was not unpleasant.



An early valve and ceramic block capacitor.

SPARK GAP PROBLEM

Tests were now carried out at arranged times to try to contact my friend in Inverell but our joint tests were unsuccessful. Warden believed we would not do much good until we could devise a method of tuning the output circuit of the spark coil transmitter. He had wound coils to separate the spark circuit from the antenna with inductive coupling, but attempts to make tuning condenser failed. The very high voltages generated by the spark coil perhaps of the order of some tens of thousands of volts, depending on the setting of the spark gap presented quite a problem.

I thought it would be interesting if I could determine the range of the transmitter. Mounting the receiver on the luggage carrier of the new motorbike which had replaced the old "one-lunger", and equipped with a coil of wire and an earthing spike, I was ready to try the idea. My brother, recently returned from the war, was not very interested in wireless experiments but offered to key the transmitter for five minutes every half hour until I returned. The results of this expedition were quite informative, though rather disappointing as regards distance covered by the transmitter. It appeared that the trees with their bushy tops absorbed or destroyed the signal. On top of a small hill across an open paddock the results were a little better, but it was found here that tuning the loose-coupler made no noticable difference to the strength of the received signal. This supported Mr Warden's theory about tuning the output circuit of the transmitter.

NEW TUBES

When I returned to school on Monday, Mr Warden was quite excited about possible new developments. He had received through the post from his friend in Sydney two of the new Expanse A vacuum tubes. He gave one of them to me and told me that he had also received a large amount of technical information on the uses of the new device. Already his vocabulary was changing, and as he spoke of continuous wave generators, of regenerative detectors, of A batteries and B batteries, I began to realise that the wireless experimenters' boundless enthusiasm was hurrying us along at a great rate. I think that at that time my youth and inexperience, like that of many others, could not forsee the enormous commercial possibilities of these new developments.

Warden was now mapping out a new programme for experiment but apart from simple tests of the new Expanse tube my time was limited. Final examinations were now approaching and as I was anxious to matriculate to Sydney University, and as my family would be moving to Sydney in a few months time, further experiments would have to wait for a while.

Although it was now obvious that the day of the loose-coupler, and the spark coil transmitter was finished I did not regret the time spent over the last eighteen months. I had acquired a grounding in wireless and could now transmit and receive Morse at about 15 words a minute. I looked forward to continuing experiments in the new home.

SPECIALIST SUPPLY SHOPS

In January 1922 my family moved to a new home in Sydney. The next three or four years were of tremendous interest to me. The meeting with new friends at University and with the rapidly growing fraternity of enthusiastic amateurs in the suburban area rekindled my own enthusiasm. The first Expanse A triode was soon replaced by a growing range of tubes. Specialist supply shops began to appear with the introduction of broadcasting and components became more readily available. Of particular help to the amateur experimenter was the publication of technical articles directed specifically to him in local and overseas journals. He was now learning something of the activity and rapid development of our hobby in Britain and the USA

JAM JARS RECTIFY

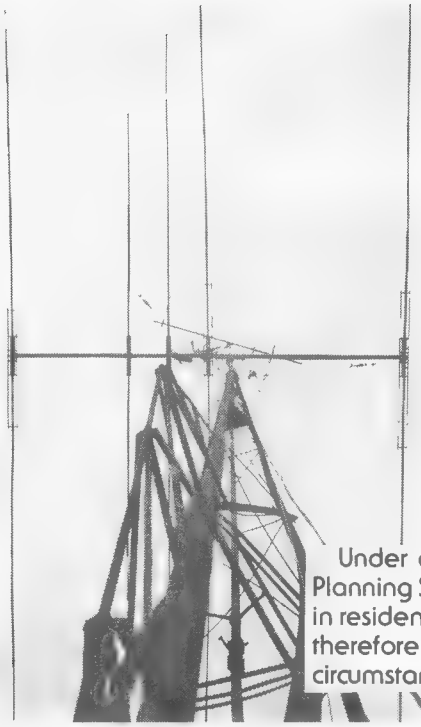
By 1925 my station after many changes in its construction would have been fairly representative of the average amateur rig for working DX. A Reinartz type receiver and a TPTG transmitter. The transmitter used a single UX210 tube. It was powered from a home-brew transformer with about 400 volts each side of the centre tap, rectified by a string of jam jars with aluminium electrodes in a borax solution, and smoothed by two or three oil immersed 2mF condenser . This was adequate for CW.

In 1928 I was notified by the Postmaster General's Department that I would have to sit for the AOPC examination. This brought me a very handsome document that I still treasure, numbered 457 and signed by J Malone, Chief Inspector, W T S Crawford, Radio Inspector, dated 8th November 1928 with my name inscribed in copperplate. On the back of the certificate is a photo of myself signed in the presence of W T S Crawford. The secrecy of those communications we might hear had to be observed.

Until the outbreak of WW2 amateur activity expanded with growing worldwide DX aided by the development of directional antennae. During the war the amateur gear had to be sealed in a box and aerials dismantled. After the war the great range of radio equipment offered to the public by the Disposals Departments helped many amateurs to get going again. From then to the present day the wonderful new technical developments in electronics have maintained or accelerated this technical revolution we now experience.

Today I enjoy a rag chew nearly every morning with some old (and some not so old) timers. Starting at 0030 on UHF we switch to the 7 MHz band at 0100 UTC and enjoy the company for an hour! The stalwarts of this session for many years have been my good friends Horrie VK2FA and Gordon VK2AVT. Many other amateurs and myself are always made welcome when we call in.

I am beginning to think that amateur radio must be a long life therapy — I turned 82 at my last birthday.



Radio Masts — a minority of municipal councils, unhappy with losing appeals, wage war on Amateur Radio.

Alan Noble VK3BBM
VK3 FEDERAL COUNCILLOR

Under a recent amendment No 115, Part 3 (Radio Masts) to the Melbourne Metropolitan Planning Scheme (MMPS) a planning permit is now required for the erection of some radio masts in residential areas of the Melbourne Metropolitan Area. This article is about Town Planning and therefore should not be confused with the requirement to obtain a building permit in appropriate circumstances.

Building permits, required under the Victorian Building Regulations, use as their criteria engineering and safety factors.

In 1979 a move was made on behalf of a small number of municipal councils to reserve a situation in which their decisions to refuse building permits for radio masts were being over-ruled by Town Planning Appeals Tribunals.

The Melbourne Metropolitan Board of Works (MMBW) advertised a proposed amendment No 115, Part 3, to the MMPS.

This was designed to bring in the requirement of a planning permit for radio masts in residential areas.

A definition of a radio mast for entry into the MMPS was.

"Radio Mast used in connection with radio transmission or reception within a dwelling, means a mast which together with antenna;

a) Exceeds a height of 14 metres above the ground, or

b) When attached to a building, exceeds a height of 5 metres above the highest part of such building."

Some eleven objections, including eight out of Melbourne's fifty three municipalities, to the proposed definition were lodged, the main thrust being that the dimensions were too generous.

The MMBW accepted the substance of the objections and early in 1981 changed its amendment to read:

a) Exceeds a height of 8 metres above the ground,

b) When attached to a building, exceeds a height of 3 metres above the roof line, or

c) Has any horizontal dimensions in excess of 3 metres.

WIA LEARNS OF PROPOSED AMENDMENTS

The WIA Victorian Division became aware of the situation even though it had not been advised or consulted as an interested party by the MMBW.

The proposal was before the then Planning Minister, Lou Lieberman, for approval.

An immediate protest was made to the Minister by the WIA on behalf of the Amateur Radio Service (ARS).

Following considerable research a thirteen page document, 11 May 1981, was sent to the Minister.

This advised on the purpose, role, and organisation of the ARS, and the technical considerations regarding physical size and height of antennae.

It also summarised cases heard where individuals or businesses had appealed to the Town Planning Appeals Tribunal in the matter of radio masts.

Of the ten cases heard in the period 1971-78 only three concerned ARS installations.

Determination made by the Tribunal in the three cases are summarised:

1) Hobby, Amateur Radio Station. Forms part of normal use of house.

2) Hobby, Amateur Radio Station. Allowed on merits.

3) Allowed on grounds that no permit was required.

The Minister was advised that the MMBW proposals could effectively prevent any future radio amateur installations from using the international frequency allocations in the way envisaged by the International Telecommunications Union and the Department of Communications.

On 16 June 1981, the Institute again wrote to the Minister with two positive alternatives to the MMBW's advanced view.

The first was that the Minister should not refer to "Radio Mast" or "Antenna" in the MMPS as it relates to the residential zoning, and a hobby or domestic use. This was supported by:

a) Town Planning Appeals Tribunals Decisions.

b) The community needs to avail itself of modern technology.

c) The right to receive radio signals broadcast for public consumption including shortwave international broadcasts and television signals in a residence.

d) The right of a citizen to engage in normal activity (hobby or interest) in his own home to the fullest extent.

e) Where a technical subject is involved, Local Government officials or councillors do not have (or rarely have) the expertise to decide what is fair or equitable, necessary or unnecessary, in regard to antennae.

f) Cost to the community would be minimised in an area (ie; radio reception and transmission) which is already governed by federal acts and regulations of a national and international character, and the natural laws of physical science.

g) An Amateur Radio Station is an asset to the local community.

It also put to the Minister the dimension(s) should be such as to exempt the majority of masts used in the ARS and that a height of 20 metres above the ground or 6 metres above the roof line with no horizontal limitation be adopted.

In this context the Institute had in mind these dimensions would include the rotatable antenna mounting pipe above the mast proper.

It was difficult to obtain from any source what exactly the MMBW considered to be mast, and what was not.

As a result of the Institute's submissions to the Minister, WIA representatives attended a meeting on 17 June, chaired by the Chief Planner, Department of Planning, to discuss the proposed amendment.

Others present were representatives of the Department of Communications, CB operators, TV Electronic Technicians Institute, TV Electronics Servicemen's Association, Antenna Manufacturing Industry, and Local Government.

At this meeting it was proposed that *"A self-regulatory approach"* to the siting of radio masts *"may be an acceptable means of ensuring that the sometimes adverse impact of radio masts is reduced."*

On 24 August the Minister wrote to the Institute:

"... to determine whether you would be prepared to take a lead role in developing guidelines which would be available to all those persons seeking to erect antennas on their properties. In view of the large amount of public interest in this issue at Local Government level I have written to the Municipal Association of Victoria (MAV) to determine if that association would be prepared to nominate representatives to work with your organisation in developing non-statutory guidelines. Should the organisation agree to participate it would be my intention to not proceed with the amendment on the assurance that acceptable guidelines are prepared, published and made available to all those wishing to participate in radio operations."

The Minister's invitation was immediately accepted.

In the following weeks the Institute sought talks with the MAV to no avail.

Having no success on a number of occasions to get the MAV to the conference table, the Institute contacted Mr D Daines, Chief Planner of the Department of Planning.

He arranged and chaired a meeting on 5 November 1981 with MAV representatives, the MAV Policy Planning Committee, City of Heidelberg, and the WIA.

The MAV took the view that the WIA should prepare the guidelines and submit them together with substantial argument to enable them to be sold to municipal councils.

It appears that the MAV was not prepared to do any of the development work toward the guidelines and had thrown the ball to the WIA.

Indeed it was to be seen later that the enthusiasm for non-statutory guidelines was hardly brimming over in the halls of the MAV.

The Institute agreed to do what it could but was in a difficult position in regard to resources to do the job. Another problem was that we had no idea of how much was understood of amateur radio by people in the MAV or municipal councils generally. Had they seen the submission to the minister or not?

It was decided that any document to the MAV had to assume no knowledge of amateur radio and it should again start from scratch. Accordingly a document *"A contribution to the development of non-statutory guidelines for the erection of masts in metropolitan residential areas"* was despatched to the MAV in March 1982. Discussion was sought to further develop the concepts presented.

The paper proposed that

— *A height of 20 metres subject to certain conditions of mast design and space availability.*
— *Masts of triangular, square or rectangular cross section having a dimension on any side in excess of 50 centimetres measured at a height of 3 metres above the ground and being of self-supporting or guyed construction could be subject to consideration by the planning authority as to its effects on 'the amenity of the area',*
— *Masts of smaller dimensions than those above should be exempt from planning control.*

The MAV arranged to meet the Institute on 6 May 1982 to discuss the WIA paper. At the meeting the Institute representatives were asked a number of questions relating to its ability to enforce a self-regulating scheme. It was apparent that the MAV was not or did not want to be impressed by the record of self-regulation in the amateur service. Questions on the number of licences issued in Victoria and the number of Institute members were asked. There was no in-depth exchange of views on the proposals put forward by the Institute and no contributions were put by the MAV.

It was the view of the WIA representatives at the time that we had wasted a lot of labour and breath. This seemed to be confirmed when a letter dated 17 June 1982 was received from the MAV in the following terms —

"The planning policy committee finalised its position on the matter and decided to make the following recommendations . . .

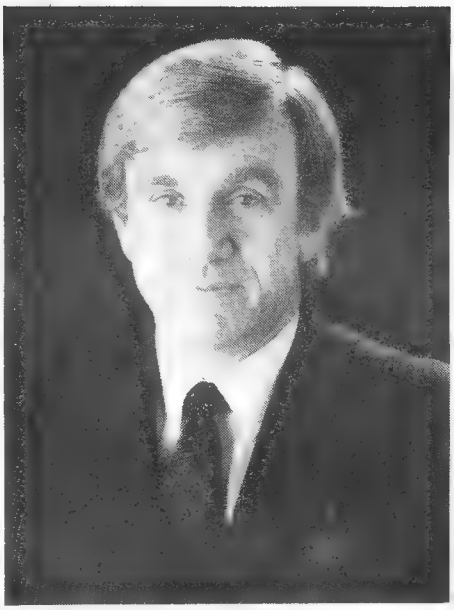
1. That the Association not support the introduction of self-regulation by the WIA, because such an approach would not provide a sufficient and enforceable system for the amenity protection of the community as a whole, particularly as the level of membership of the WIA is not sufficiently high to enable the Institute to effectively enforce the compliance of all residence-based amateur (hobby) radio operators, with self-regulations, it being noted that WIA membership in Victoria constitutes only 48-55 percent of the total number of amateur operators . . .".

It continued with a number of other recommendations which effectively threw the ball to the Department of Planning.

Even though the MAV had used incorrect statistics in coming to its conclusion on the percentage membership of the WIA (the MAV had used members against licences instead of taking members against licencees with allowance for multiple licensed operators). It did raise a significant point in that from an outsiders view even 67 percent membership (about the correct figure at the time) is not over-impressive and most certainly would not have changed their opinion. It is however something to contemplate as to what might have been the attitude had the institute been able to claim 95-100 percent membership.

The Victorian Government changed in April 1982 and a new minister for planning, Mr Evan Walker. The planning department reported to Mr Walker in August 1982 and recommended that the amendment as previously proposed by the MMBW be adopted.

The minister's response was that the issue be referred to the Natural Resources and Environment



Mr Evan Walker

Committee of the State Parliament, for investigation and report.

On the 7 December 1982, the committee was directed by His Excellency the Governor in council:

"To inquire into, consider and report to Parliament by 30 June 1983, whether the environmental impact of larger radio masts throughout the metropolitan area is of a degree of significance sufficient to justify municipal control over the appearance of such masts in residential areas."

The first problem was the answer to the question *'what is a larger radio mast'*? secondly what constitutes *'environmental impact'*? There was no definitive answer available from the inquiry committee, the Department of Planning or the MMBW. *Had we spent the last two years working, talking, and writing submissions to people who could not now say precisely what they were on about?*

So again the Institute was faced with the task of informing a new group of people about amateur radio and some of the simpler aspects of radio propagation and antenna technology.

There were 612 submissions to the inquiry, the majority being pro-forma letters from radio amateurs. a number of detailed submissions were also received from interested amateurs. The Institute's submission ran to 15 pages plus 19 pages of appendices. (That submission is reprinted in full in the report of the committee of inquiry, dated September 1983, and available from the Victorian Division).

The Committee held a public hearing on 20 May 1983 at Parliament House. The Institute was represented by Alan Noble VK3BBM, Jim Linton VK3PC and Jack O'Shannassy VK3SP.

In September 1983 the inquiry presented its report to parliament and recommended that the MMPS be amended to define "radio mast" as *"radio mast used in conjunction with the transmission or receipt of wireless, telegraphy or television means a mast which together with antennae —*

a) has any horizontal distance in excess of 3 metres, or

b) when attached to a building, exceeds a height of 5 metres above the roof line, or

c) when not attached to a building exceeds a height of 14 metres above the ground."

"Antennae are to be defined as rigid elements attached to the radio mast or rotating boom supported by the radio mast. This definition does not include flexible wires or cables."

The committee also suggested each municipality in the Melbourne metropolitan area be requested to establish guidelines for the approval of permits for larger radio masts.

The Institute viewed these proposals with deep concern. It was apparent little of what we had submitted received much attention, although it was evident the committee had recognised that 14 metres and 5 metres were more reasonable than the 8 and 3 metre height dimensions recommended by the MMBW.

The WIA requested a meeting with the minister, Mr Walker to discuss its concerns. A meeting took place in April. Mr Walker who had been due to tell Parliament what he intended to do, sought leave of Parliament to extend his deliberation.

At the end of July 1984, having heard nothing further, the Institute contacted the Department of Planning to find out any developments. The Departments view had not been firmed up at this time.

The Institute was aware of the concern in other places that it had not responded to the report of the Committee of Inquiry now before the Parliament. It was borne in mind that similar submissions had now been made three times to different areas of authority. It appeared as if none of them had been taken very seriously.

At the beginning of October 1984, the Institute received a telephone call indicating that the Department of Planning had reached a position on its advice for the minister and an invitation was received to have discussion.

At a meeting some two days later it was plain that we were not to be informed of the content of that advice, but it was put to us that our main concern was in the area of the horizontal dimension limitation proposed. The Institute's reply indicated concern at a number of proposals out of the inquiry including that mentioned. There was a request made that the Institute state its concerns in writing within a few days.

A letter from the Divisional council was sent on the 11th October. It said that:

The Institute viewed the Report as being ill-conceived, serving neither the cause of intelligent planning in the community nor the interests of those who would be the major target of the proposed controls — the members of the Amateur Radio Service.

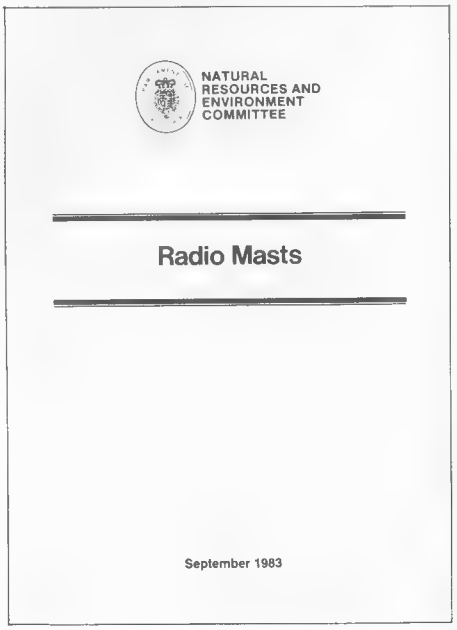
This view was formed from the following observations of the Reports as printed:

There was no conclusive evidence on which to reach a conclusion that planning control over radio masts is justified;

The Report showed clearly those in favour of planning control are in the minority;

The Report also showed the minority of individuals and municipalities in favour of controls has failed to make out a substantial case;

There appeared to have been assumption, that because there had been a public inquiry, planning control was the logical outcome. This Institute disagreed. The alternative of no planning control had



not been seriously considered;
Statistics quoted in this Report had been used with gay abandon. Figures had been used out of context, "imagined" and abused.
The Minister for Planning and Environment submitted his report to the Legislative Assembly on the 24th October 1984.

In regard to his proposed action the Minister said:
PROPOSED ACTION
I have given consideration to the Committee's recommendations and to the various arguments put forward in the statutory processing of the amendment and I now proposed to recommend Governor in Council approval of Amendment No 115, Part 3 to the following general effect:
A Radio mast is a mast which, together with antenna:
(i) exceeds a height of 14m above the ground;
(ii) when attached to a building, exceeds a height of 5m above the roof line;
(iii) has any horizontal distance in excess of 6m; or
(iv) has a structure, not including antennae, exceeding 50cm in width at any point in excess of 3m above ground level.

In coming to my recommendation I have of course noted the reference in the Committee's recommendation to television reception. The concept of planning control over masts for domestic television reception is one that has not been canvassed in the statutory processing of Amendment No 115 and as such should not be considered in the absence of public debate on its planning merits. I propose therefore to raise this aspect of the Committee's recommendation with the Board of Works and to exclude domestic television reception from the operation of the amendment.

The other point to be noted is that I am of the view that a horizontal dimension of up to 6m would be reasonable, in amenity terms, rather than the 3m recommended by the Committee.

By way of technical consideration I am advised that the radio masts of Citizen Band operators do not normally exceed 6m in width.
Radio Mast is to be subject to planning permit, generally in accordance with the Committee's Recommendation, *subject to consequential amendments to zones* not referred to by the Committee.

In addition, I support the general thrust of Committee Recommendation, (3) and will be pursuing this Recommendation with the Board of Works and municipal Councils.

WHAT NOW?

Although we did not win exemption from planning control for the most commonly used mast and antenna configuration, at least some satisfaction can be taken from the fact we are not limited to the much more stringent dimensions as proposed by the MMBW in 1981.

Those municipalities who consider a height of 14 metres to be too generous in 1979 may take action in the future to whittle away the dimensions now decided. If the Minister proceeds with the proposal that each municipality should draw up its own guidelines for radio masts we could have some fifty three different sets of rules in the Melbourne Metropolitan area.

It will be interesting to note the attitudes of municipal councils toward applications for masts, particularly with a view to the involvement of radio amateurs described by the Victorian Bushfire Review Committee as a 'Valuable Community Resource', in Municipal Disaster Plans and Regional Disaster plans now being drawn up to protect the people of Victoria in times of danger to life and property.

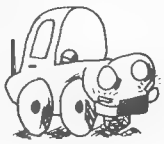
ACKNOWLEDGEMENTS

The author of this article wishes to acknowledge the contributions, advice and active assistance so willingly and freely given over the last four years in the protection of the interests of amateur radio. VK3KKA, VK3YIP, VK3DBB, VK3AFQ, VK3GG, VK3BCY, VK3SP, VK3DES, VK3PC, VK3BYA, VK3KI, VK3KP, VK3XV, WIA Federal Councillors in other states who have kindly kept me aware of mast related developments in their states and all amateurs who submitted letters to the inquiry.

The issue of radio masts has the WIA's continued attention.

AR

TURN INDICATORS ON HOLDEN CAMIRA AFFECTED BY RF FROM 2 METRE TRANSMISSIONS



Rodney Champness VK3UG
31 Helms Court, Benalla, Vic. 3672

A friend and I both have Holden Camiras and both of us have trouble with the turn indicators malfunctioning if transmissions are made whilst the indicators are on. To overcome the trouble place 2-0.001uF ceramic capacitors, one on the 12 volt DC line to the Bosch flasher unit and the other on the indicator out line, in both cases the other terminal goes to earth. The indicator flasher unit is dismantled by prising the plastic cover off and the capacitors are soldered directly to the three spade terminals just inside the plastic case. They are a tight fit but, with care, fit quite comfortably.

The flasher unit is located on the fire wall directly behind the instrument binnacle. To get at it, it is necessary to remove the escutcheon around the instrument panel, taking care not to break the rear window demister on/off switch.

It is also necessary to disconnect the other two cables that terminate in dummy sockets on the left side of the instrument panel.

You may need to remove the plastic cover over the steering column, which will involve taking out several screws accessable from below the steering column. Next remove the shroud over the instruments, note that there is one screw at the back of the shroud accessable above the instruments.

Having removed this the instruments themselves have to be removed, and the screws to do this are readily accessable. The instruments may now be pulled forward and reaching behind remove the vacuum line to the economy gauge if fitted and remove the speedometer cable by squeezing the retaining clip to disengage it. Now the instruments can be withdrawn a bit further and the two multi pin sockets and cables can be unplugged and the instruments can be taken out of the way allowing access to the flasher unit.

Removing the instruments is by far the hardest part of the work. It is not difficult to ascertain which of the terminals are which on the flasher. When un-plugged a multimeter will show which terminal is which on the socket, and hence the flasher. As quite a few new cars have the electronic flashers fitted to them, the information above should be of use in suppressing flashers on other vehicles. I know that the Datsun Bluebird flashers are affected by RF and should be amenable to the same suppression techniques. The electronic flashers consist usually of an integrated circuit, a few resistors and capacitors, and a relay.

AR

"DX BEFORE DISHES!"

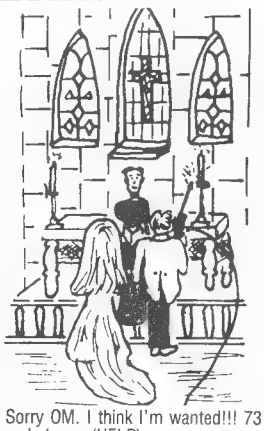
DX before dishes?
That's OK I suppose.
The dishes are always with us,
The DX comes and goes.

And though the dust is inches thick
That is a matter minor
When you hear, above the QRM
A YL voice from China!
Crumbs upon the carpet?
You can't vacuum the floor!
You might miss, above the cleaner's noise
A chat with Labrador.

What if you haven't made the beds,
Or if the kids are bawling?
These things are unimportant
If you hear San Felix calling!
What if the lawn needs mowing,
All the windows ceased to shine?
Who cares about those boring chores
When Svalbard's five by nine?
The OM's bent the tin-opener?
Well! Who can think of cooking,
When Africa is coming in
And round the bands you're looking.
BUT — If you do the dishes
(with one ear to the set)
Here's a bit of good advice
'Twould pay not to forget!
If you should hear some rare DX
Which everything surpasses;
Don't "drop what you are doing"
If you're washing crystal glasses!

Written by Joy Collis VK2EBX
Contributed by Marlene Austin VK5QO

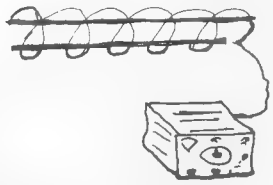
AR



from QRM, March 1985

Sorry OM. I think I'm wanted!!! 73 and cheers (HELP)

THE EFFECT OF GROUND REFLECTIONS ON CIRCULAR POLARISATION



David Robertson, VK5RN
10 Milan Street, Stirling, S.A. 5152

The effect of a flat earth upon vertically and horizontally polarised waves is dealt with in most antenna handbooks. An excellent treatment is given in the RSGB Radio Communication Handbook (12.15). Here the vertical polar diagrams for vertical and horizontal antennas over a perfectly conducting plane earth are given and the method of images is explained. This article deals with circular polarisation.

To calculate the vertical polar diagram of an antenna a distance H above a plane perfectly conducting earth, one replaces the earth with an image antenna a distance H below the ground. For a vertically polarised antenna, the image is in phase with the real antenna and for a horizontally polarised antenna, the phase of the image is reversed.

With circularly polarised waves the problem is not quite as simple. Electromagnetic waves consist of an Electric (E) field and a Magnetic (H) field, both normal to the direction of propagation and to one another. A vertically polarised wave has its E field vertical and its H field horizontal. A horizontally polarised wave has its E field horizontal and its H field vertical. A circularly polarised wave has its E and H fields perpendicular to one another, as before, but they both rotate once every RF period, the sense of the rotation being either right or left handed.

A circularly polarised wave can be considered as a horizontally polarised wave combined with a vertically polarised wave, the two waves being in phase quadrature. The question is, *what does a perfectly conducting flat earth do to these waves?*

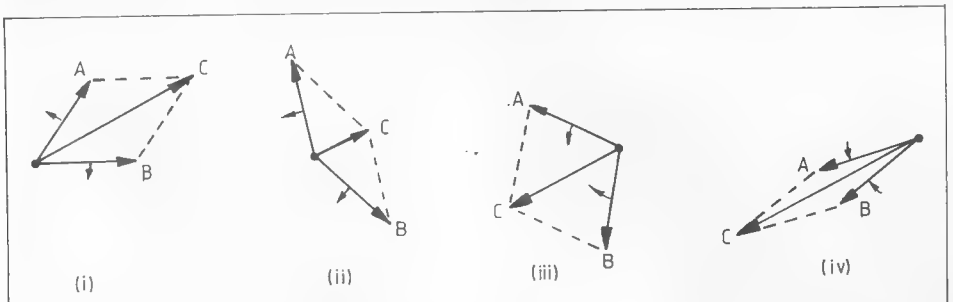


Figure 1 — Two counter rotating vectors, A and B, and their resultant C. Time increases from left to right.

Just as a circularly polarised wave can be regarded as a combination of plane waves, a plane wave can be regarded as a combination of two circularly polarised waves rotating in opposite directions. This is shown in figure 1, where the two E fields are represented as vectors rotating in opposite directions. To get the resultant of these two counter-rotating vectors one simply adds them. As can be seen in figure 1, the resultant vector oscillates back and forth without rotating. It is plane polarised. It should be said that the term plane polarised refers to the plane containing the E vector and the direction of propagation. To be consistent, one should call them linealy polarised if one is to refer to circularly polarised waves as circular.

Referring to figure 1 again, it can be seen that the direction of the resultant depends on which way the two counter rotating components were pointing at t=0. In other words, the direction of the resulting plane polarisation, horizontal, vertical or slant depends upon the phase difference between the two circular components.

After all this, let's return to the problem of a circularly polarised antenna above a perfectly conducting flat earth. *What sort of image antenna should one use?* Well, we know that the phase of a horizontally polarised wave is reversed on reflection and that the phase of a vertically polarised one is not reversed. If one considers a circularly polarised wave as a combination of vertically and horizontally polarised waves, then phase reversal of one component relative to the other will cause the sense of the polarisation to reverse. That is to say, a right hand circularly polarised wave will become a left hand circularly polarised wave and vice versa.

In order to calculate the vertical polar diagram, one must therefore combine the fields of two counter rotating circularly polarised antennas, a real one above ground and its image an equal distance below ground. We have already seen that this combination gives rise to plane polarisation, the direction of polarisation being a function of the phase difference between the two circular components.

The vertical polar diagram of a circularly polarised antenna above earth is therefore uniform. The amplitude of the radiation field is independent of the angle of elevation. The resultant radiation is plane polarised and only the orientation of the plane of polarisation varies with the angle of elevation. *Unlike horizontally or vertically polarised antennas, there are no nulls.*

For angles of elevation that are larger than the vertical half beamwidth of the antenna, it is necessary to tilt the antenna and then the major lobe does not strike the earth. Under these circumstances there is no ground reflection and the antenna will deliver circularly polarised radiation.

All is not lost. At least there are no nulls in the vertical polar diagram. In this respect, a circularly polarised antenna is highly desirable. In fact, this property is probably more useful than the provision of circularly polarised radiation at a satellite. It would be nice to have no nulls and circular polarisation, but you can't have both without using very narrow band widths.

At wavelengths of 2 metres or 70 centimetres, extremely narrow beams are beyond the reach of most of us.

Slant polarisation turns out to be no better than vertical or horizontal polarisation. A mathematical analysis of circularly and slant polarised antennas above a perfectly conducting horizontal earth follows. *(It assumes a zero antenna elevation but the general conclusions apply for elevations of less than the vertical half beamwidth, a common situation. Oscar 10 often requires using elevation angles of 10° or less . . . Ed)*

MATHEMATICAL ANALYSIS

The electric field of a circularly polarised wave can be expressed as $E = Eo \exp(i\omega t)$
where Eo is the amplitude of the field, $\omega = 2\pi \times$ frequency, $i = \sqrt{-1}$, and t = time.

From here on, E_o will be set to the value of 1 and the field will be expressed as $E = \exp(iwt)$. This is a vector rotating anticlockwise once every RF period. (once every 1/f seconds).

Figure 2 shows an antenna with its image below ground. The wavefront from the image has to travel a distance EC more than the wavefront from the real antenna in order to reach a distant point P.

$BC = 2.H. \sin \Theta$

Remembering that the image antenna is also circularly polarised, but in the opposite sense to the real one, and that its phase is also reversed, we can write the field at P as:-

$E = - \exp(-i\omega t) \exp(-ik\ (2\ H \sin \Theta))$

The first negative sign gives the phase reversal of the horizontal component and the -iwt instead of iwt makes the sense of rotation clockwise instead of anticlockwise. The second exponential gives the extra phase shift of the wave from the image antenna due to the extra distance of travel BC.

$k = 2\pi/\lambda$ where λ = wavelength

The resultant field at P is the sum of the two fields

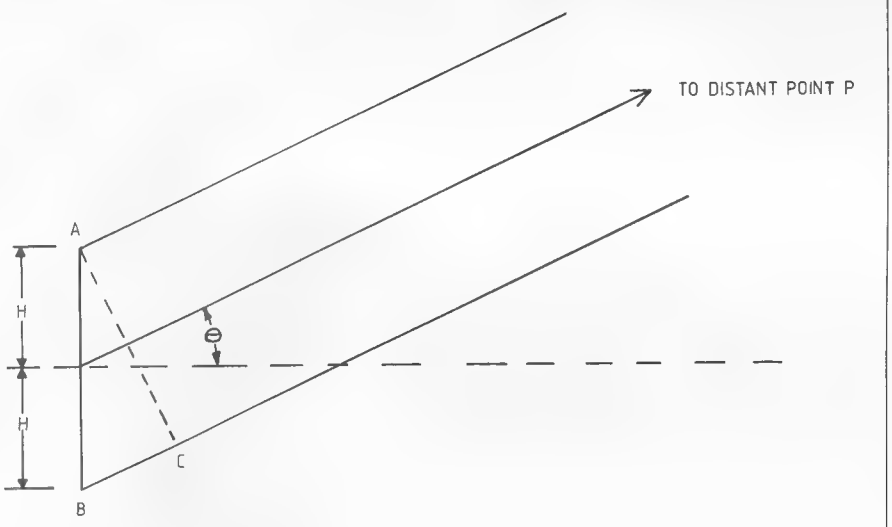


Figure 2 — An antenna, height H above ground and its image.

$E = \exp(i\omega t) - (\exp(-i\omega t))(\exp(-i\alpha))$
where $\alpha = 2.K.H.\sin\theta$

It is now time to resolve the field at P into its real (horizontal) and imaginary (vertical) parts.

Using the identities

$\exp(i\omega t) = \cos\omega t + i\sin\omega t$
$\exp(-i\omega t) = \cos\omega t - i\sin\omega t$
$\exp(-i\alpha) = \cos\alpha - i\sin\alpha$

and making these substitutions,

$E = \cos\omega t(1 - \cos\alpha) + \sin\omega t.\sin\alpha + i\sin\omega t(1 + \cos\alpha) + i\cos\omega t.\sin\alpha$

Using standard trigonometrical formulae which can be found in trigonometry books and also on page 277 of the Radiotron Designers Handbook fourth edition, this can be reduced to

$E = 2[\sin(\alpha/2) + i\cos(\alpha/2)].\sin(\omega t + (\alpha/2))$

The component of E along the horizontal axis is:-

$2\sin(\alpha/2).\sin(\omega t + (\alpha/2))$

Its component along the vertical axis is:-

$2\cos(\alpha/2).\sin(\omega t + (\alpha/2))$

These two components are in phase with one another because both RF phase angles are the same and equal to $(\omega t + (\alpha/2))$.

The polarisation is therefore plane.

The amplitude is given by:-

$A = 2\sqrt{\sin^2(\alpha/2) + \cos^2(\alpha/2)} = 2$

We therefore have a plane polarised wave arriving at P with a constant amplitude that is independent of antenna height and the elevation angle.

The angle that this plane makes with the horizontal is given by:-

$\phi = \text{Arc Tan (imaginary/real)}$

$\phi = \text{Arc Tan}((\cos(\alpha/2))/(\sin(\alpha/2)) = \pi/2 - (\alpha/2)$ radians

At zero elevation, $\theta = 0$, and $\alpha = 0$, $\phi = 90°$ and the polarisation is vertical.

When $\alpha/2 = \pi/2$, $\phi = 0$ and the polarisation is horizontal.

SLANT POLARISATION

For simplicity, let the antenna be slanted at an angle of 45°. This gives horizontal and vertical components of the same amplitude. Neglecting the $1/\sqrt{2}$ factor, the field can be written:-

$E = \cos\omega t + i\cos\omega t - \cos(\omega t - \alpha) + i\cos(\omega t - \alpha)$

The first two terms give the field the real antenna and the other two terms give the field from the image antenna.

With slant polarisation, the vertical and horizontal components are in phase with one another so that I have expressed the wt parts as cosine functions. Sine functions could have been used equally well. However, unlike the circular case, there is not a mixture of Sinwt and Coswt terms.

This equation can be expanded to:-

$E = [\cos\omega t(1 - \cos\alpha) - \sin\omega t.\sin\alpha] + i[\cos\omega t(1 + \cos\alpha) + \sin\omega t.\sin\alpha]$

The terms inside the first square bracket give the horizontal component of E and the terms in the second square bracket give the vertical component.

In general, the polarisation is elliptical. For a given value of α, the ellipse can be drawn by varying wt and plotting the real part of E along the horizontal axis and its imaginery part along the vertical axis.

When $\alpha = 0, 360, \ldots$ the polarisation is plane and vertical and when $\alpha = 180, 540, \ldots$ the polarisation is plane and horizontal. When $\alpha = 90, 450, \ldots$ the polarisation is left hand circular and when $\alpha = 270, 630, \ldots$ the polarisation is right hand circular. With other values of α the polarisation is elliptical. With increasing elevation angle, starting from O, the polarisation will vary as follows. Vertical, LH elliptical, LH circular, LH elliptical, horizontal, RH eliptical, RH circular, RH elliptical.

Vertical . . . For a slant angle of -45° change LH into RH and RH into LH.

The amplitude of the horizontal component of E is given by:-

$Ah = \sqrt{(1 - \cos\alpha)^2 + \sin^2\alpha}$

The amplitude of the vertical component is:-

$Av = \sqrt{(1 + \cos\alpha)^2 + \sin^2\alpha}$

The peak power is $Ah^2 + Av^2 = 4$

Power is therefore independent of the angle of elevation. The slant antenna shares this property with the circularly polarised antenna. If, however, the satellite borne antenna is circularly polarised, the slant antenna is a bad choice. This is because there are ranges of elevation angle for which the polarisation from the ground based antenna will be in the wrong sense. The sense alternates between left and right hand and crossed polarisation is equivalent to a null.

CONCLUSION

For satellite communications at low angles of elevation, circularly polarised ground based antennas are better than slant, vertical or horizontally polarised antennas when the satellite uses circular polarisation.

The reason for circularly polarised antennas being best is NOT for the commonly accepted reason that such antennas deliver matching circularly polarised waves to the satellite, but because they deliver constant amplitude plane polarisation at low elevation angles. There are no nulls in the vertical polar diagram.

At high elevation angles, circularly polarised antennas win again because, in the absence of ground reflections, they do deliver circular polarisation to the satellite antennas.

AR

SEARCH FOR ILLEGAL CHIPS

The Mitsubishi Electric Corporation is keen to trace a series of reject M5K4164ANP15 64k dynamic RAM chips illegally released onto the world market by a Japanese toy manufacturer.

The chips, which number around 500,000, failed to meet Mitsubishi Electric's stringent quality control requirements and were sold unbranded to the toy manufacturer, purportedly for a decorative application.

Sensing there was a quick dollar to be made, the company then had them overprinted with the Mitsubishi logo, and part number and resold them to several trading houses.

From that point, the chips have found their way around the world.

However, the problem for the ultimate end-users of the rejects is that they don't carry the usual guarantee because the chips weren't bought direct from Mitsubishi Electric.

According to Mr Jon Spence a spokesman for the Australian arm of the company, none of the rejects have yet been discovered in this country, and a large proportion have since been recovered in the United States and elsewhere.

He said that the chips could appear a little dirty from lengthy storage and carry 841809 and 842105 batch marks.

Anyone finding the chips should contact Jon Spence at Mitsubishi Electric Australia Pty Ltd, 73-75 Epping Road, North Ryde, NSW 2113, telephone (02) 888 5777.

from Electronics News — January 1985

AR

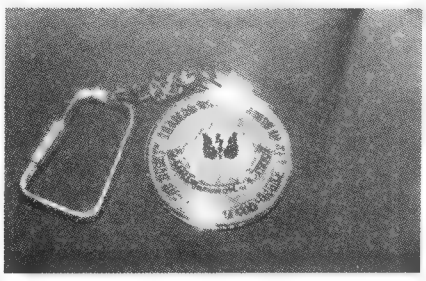
THOUGHT FOR THE MONTH

Are you an active member, the kind who would be missed,
Or are you just content to have your name upon the list?
Do you attend the meetings and mingle with the flock,
Or do you stay at home most times, to criticize and mock?
Do you take an active part to help the work along,
Or are you satisfied to be the kind that just belong?
Do you ever volunteer to help to guide the stick,
Or leave the work to just a few, and talk about the clique?
Come to the meetings often and help with hand and heart,
Don't just be a member, but take an active part.
Think this over member, you know right from wrong,
Are you an active member, or do you just belong.

From the "Off Roadrunner"
Contributed by Jim Linton VK3PC

AR

WIA 75th ANNIVERSARY KEY RINGS

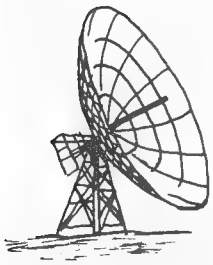


$3.50 + p&p

Available from your Division.

LOCATION OF GEOSTATIONARY SATELLITES

Harold Hepburn VK3AFQ
4 Elizabeth Street, Brighton East, Vic.



Some few years ago the writer had a passing professional interest in determining the "aiming" of antennae for use with geostationary satellites such as the proposed Aussat TV series. At that time computations were done using a pocket calculator — a rather time consuming process.

Recently a Commodore C-64 was acquired, primarily for its word processing capabilities since retirement had meant separation from "free" secretarial services Somewhere along the line it was realised that a simple C-64 programme for determining the Azimuth, Elevation and Range of geostationary satellites might prove useful, especially if the proposals by AMSAT to put up a series of amateur "geostats" becomes a reality.

A printout of the programme finally developed is given at the end of this article and some comment on it may assist those who wish to alter or expand it.

Line 10 is the usual "name of file" line.

Line 11 clears the screen while Lines 12, 13, and 14 set the background, border and character colours. This particular colour combination happens to suit the writers monochrome monitor but it can easily be altered to suit the individual preferences of users with full colour facilities.

Lines 20-90 provide a heading which is suitably framed and centered for a 40 column display.

When the programme is RUN lines 110 and 115 ask users to enter their latitude with a reminder that southern latitudes must be negative (eg: Melbourne would require an entry of -38).

Lines 135 and 150 ask for the observers longitude with the prompt that the entry should be expressed in degs west.

Line 160 asks entry of the satellite position (also in degs west) while Line 180 asks for entry of the satellite name.

Line 190 establishes a value for Pi, which, together with Lines 200 and 210, convert the entered angles in degrees into angles expressed in radians. This transformation is necessary because the C-64 can only process radians, not degrees.

Lines 300, 310, 320 and 335 do the calculations to determine satellite azimuth and elevation (in radians — they will be transformed back to degrees later in the programme.)

Line 340 calculates the distance (Range) of the satellite in kilometres.

Lines 350 and 370 transform the angles in radians back into degrees.

Lines 400, 410 and 430 put the answers (rounded off to the nearest whole number) on to the screen.

If the answer to the elevation calculation is zero, or a negative quantity, the satellite is either right on the horizon or below it. Under these conditions the satellite is not accessible. Line 375 checks for that situation and, if the calculated elevation is less than a nominal 1 deg, the programme bypasses the normal printout and instead Line 580 puts the message "SATELLITE BELOW HORIZON" on to the screen. The CHR$(18) reverses out this message for further emphasis.

```
10 REM"LOCATORS"
20 POKE 53280,4
30 POKE 53281,0
40 PRINT CHR$(5)
100 PRINT CHR$(147)
110 PRINTSPC(6)"*****************************"
120 PRINTSPC(6)"*                           *"
130 PRINTSPC(6)"*    LOCATOR PROGRAMME      *"
140 PRINTSPC(6)"*         FOR C-64          *"
150 PRINTSPC(6)"*                           *"
160 PRINTSPC(6)"*  BY H.L.HEPBURN VK3AFQ    *"
170 PRINTSPC(6)"*                           *"
180 PRINTSPC(6)"*****************************"
190 PRINT
220 PRINTSPC(10)"THIS PROGRAMME WILL -"
230 PRINT
240 PRINTSPC(1)" (1) DETERMINE IARU 'LOCATORS'"
250 PRINTSPC(1)"       FROM MAP REFERENCES"
260 PRINT
270 PRINTSPC(1)" (2) WORK OUT MAP REFERENCES"
280 PRINTSPC(1)"          FROM 'LOCATOR'"
290 PRINT
300 PRINTSPC(1)" (3) CALCULATE BEAM HEADINGS AND"
310 PRINTSPC(1)"     DISTANCES FROM MAP REFERENCES"
320 PRINT
330 PRINT
340 PRINTSPC(1)"PRESS 1,2 OR 3 AND 'RETURN' TO SELECT"
350 PRINTSPC(1)"DESIRED FACILITY.PRESS 4 AND 'RETURN'"
352 PRINT SPC(1)"TO END"
355 INPUT"                ";W%
370 IF W%=2THEN GOTO 3000
380 IF W%=3 THEN GOTO 3930
385 IF W%=4 THEN END
990 PRINT CHR$(147)
1000 PRINT" ENTER DEGREES PART"
1010 INPUT" OF YOUR LONGITUDE      ";LO
1020 PRINT" ENTER MINUTES PART"
1030 INPUT" OF YOUR LONGITUDE      ";LV
1040 PRINT" ARE YOU EAST OR WEST"
1050 INPUT" OF GREENWICH           ";LQ$
1060 LV=LV/60:REM-CALCULATES DECIMAL MINUTES
1070 LO=LO+LV:REM-EXPRESSES TOTAL DECIMAL DEGREES
1080 IF LQ$="E" THEN LO=180+LO
1090 IF LQ$="W" THEN LO=180-LO
1120 LR=INT(LO/2):REM-GIVES INTEGRAL PART OF LO/2
1125 LR=LR-10
1130 IF LR>9.99999 THEN GOTO 1125: REM - LR NOW=THIRD CHARACTER OF LOCATOR
1140 LS=INT(LO/20)
1170 IF LS=0 THEN LET C1$="A"
1180 IF LS=1 THEN LET C1$="B"
1190 IF LS=2 THEN LET C1$="C"
1200 IF LS=3 THEN LET C1$="D"
1210 IF LS=4 THEN LET C1$="E"
1220 IF LS=5 THEN LET C1$="F"
1230 IF LS=6 THEN LET C1$="G"
```

```
1240 IF LS=7 THEN LET C1$="H"
1250 IF LS=8 THEN LET C1$="I"
1260 IF LS=9 THEN LET C1$="J"
1270 IF LS=10 THEN LET C1$="K"
1280 IF LS=11 THEN LET C1$="L"
1290 IF LS=12 THEN LET C1$="M"
1300 IF LS=13 THEN LET C1$="N"
1310 IF LS=14 THEN LET C1$="O"
1320 IF LS=15 THEN LET C1$="P"
1330 IF LS=16 THEN LET C1$="Q"
1340 IF LS=17 THEN LET C1$="R"
1345 LX=LO/2
1350 LP=LX-(INT(LX))
1355 LP=INT(LP*24)
1370 IF LP=0 THEN LET C5$="A"
1380 IF LP=1 THEN LET C5$="B"
1390 IF LP=2 THEN LET C5$="C"
1400 IF LP=3 THEN LET C5$="D"
1410 IF LP=4 THEN LET C5$="E"
1420 IF LP=5 THEN LET C5$="F"
1430 IF LP=6 THEN LET C5$="G"
1440 IF LP=7 THEN LET C5$="H"
1450 IF LP=8 THEN LET C5$="I"
1460 IF LP=9 THEN LET C5$="J"
1470 IF LP=10 THEN LET C5$="K"
1480 IF LP=11 THEN LET C5$="L"
1490 IF LP=12 THEN LET C5$="M"
1500 IF LP=13 THEN LET C5$="N"
1510 IF LP=14 THEN LET C5$="O"
1520 IF LP=15 THEN LET C5$="P"
1530 IF LP=16 THEN LET C5$="Q"
1540 IF LP=17 THEN LET C5$="R"
1550 IF LP=18 THEN LET C5$="S"
1560 IF LP=19 THEN LET C5$="T"
1570 IF LP=20 THEN LET C5$="U"
1580 IF LP=21 THEN LET C5$="V"
1590 IF LP=22 THEN LET C5$="W"
1600 IF LP=23 THEN LET C5$="X"
1610 REM-LINES 1350-1600 GENERATE THE FIFTH CHARACTER OF LOCATOR
2000 PRINT" ENTER DEGREES PART"
2010 INPUT" OF YOUR LATITUDE       ";LA
2020 PRINT" ENTER MINUTES PART"
2030 INPUT" OF YOUR LATITUDE       ";LB
2040 PRINT" ARE YOU NORTH OR"
2060 INPUT" SOUTH OF THE EQUATOR   ";LC$
2070 LA=LA+(LB/60)
2080 IF LC$="N" THEN LA=90+LA
2090 IF LC$="S" THEN LA=90-LA
2100 LD=INT(LA)
2110 LD=LD-10
2120 IF LD>=10 THEN GOTO 2110:REM LD NOW=THE 4TH. CHARACTER OF LOCATOR
2130 LE=INT(LA/10)
2150 IF LE=0 THEN LET C2$="A"
2160 IF LE=1 THEN LET C2$="B"
2170 IF LE=2 THEN LET C2$="C"
2180 IF LE=3 THEN LET C2$="D"
2190 IF LE=4 THEN LET C2$="E"
2200 IF LE=5 THEN LET C2$="F"
2210 IF LE=6 THEN LET C2$="G"
2220 IF LE=7 THEN LET C2$="H"
2230 IF LE=8 THEN LET C2$="I"
2240 IF LE=9 THEN LET C2$="J"
2250 IF LE=10 THEN LET C2$="K"
2260 IF LE=11 THEN LET C2$="L"
2270 IF LE=12 THEN LET C2$="M"
2280 IF LE=13 THEN LET C2$="N"
2290 IF LE=14 THEN LET C2$="O"
2300 IF LE=15 THEN LET C2$="P"
2310 IF LE=16 THEN LET C2$="Q"
2320 IF LE=17 THEN LET C2$="R"
2330 REM LINES 2140 TO 2320 GENERATE THE SECOND CHARACTER OF LOCATOR
2340 LF=LA-INT(LA)
2345 LF=INT(LF*24)
2350 IF LF=0 THEN LET C6$="A"
2360 IF LF=1 THEN LET C6$="B"
2370 IF LF=2 THEN LET C6$="C"
2380 IF LF=3 THEN LET C6$="D"
```

As already indicated, changes to colour combinations can be made to suit individual preferences. More importantly, the minimum elevation angle of 1 deg used in Line 375 needs a bit more consideration. Unless the observer is blessed with a hilltop, or otherwise totally unobstructed, site then anything below an elevation angle of between 5 and 10 degs may represent a more practical minimum. It is left to the user to decide what minimum angle is finally entered into Line 375.

Currently there are two geostationary satellites which can be seen from anywhere in Australia.

ATS1 is situate at 191.78 W and puts out programmes (mostly in English) on 136.46 and 137.35 MHz FM. Hearing this particular satellite should present no difficulty to anyone prepared to "tweak" a 2 metre converter down a bit. The second is a new Japanese weather satellite situate at 220 W. It operates about 2280 MHz. If you have the gear this one will be well within range.

There is a third, named SIRO which is situate at 295.65 W. It transmits weather information on 136.1376 and 136.1381 MHz, but its locations makes it inaccessible from the eastern seaboard. In Adelaide it is only 4 degs above the horizon but in Perth it's a very usable 25 degs up

Current planning by AMSAT envisages three geostationary amateur satellites. If they are equally spaced at 120 degs round the equator, then at least one will be visible from anywhere in Australia and will always be at least 10 degs above the horizon.

It is hoped that this programme, even if its application is not immediately obvious, will in the future, solve the odd "where do I point my antenna?" problem.

Editor's Note:

For those who would like test data to check the operation of their programme, the following will be useful.

Satellite	*Aussat-3*	*ATS1*
Position	*160 E*	*191.78 W*
Azimuth	*335*	*324*
Elevation	*44*	*40*
Range	*37472*	*37740*

Both readings were made from 37S latitude and 145E longitude.

AR

COMPUTER HELP FOR DEAF CHILDREN

A computer programme that helps deaf children to read from an early age has been devised at Bristol University's School of Education in south-west England.

Known as Catch Up, the system consists of a concept keyboard pad, a BBC computer and VDU, and a print-out unit. Symbols similar to the Egyptian hieroglyphs representing nouns, verbs, etc, are stored in the computer memory. The child places an illustrated sheet on top of the concept keyboard and places a finger on the drawing of the object in which it is interested — for example a car. The symbol for a car then appears on the VDU screen. Later the word "car" is added and by association of symbols with words, the child learns to read.

Progressing from simple symbols, which can be animated to indicate motion — eg a man running to indicate the present tense of the verb to run — the child uses a question and answer sheet to form short sentences. Eventually it can compose short stories, based on symbols chosen from an illustrated sheet, and obtain a print-out. Corrections can also be made by the child.

From New Technology in Britain

AR

```
2390 IF LF=4 THEN LET C6$="E"
2400 IF LF=5 THEN LET C6$="F"
2410 IF LF=6 THEN LET C6$="G"
2420 IF LF=7 THEN LET C6$="H"
2430 IF LF=8 THEN LET C6$="I"
2440 IF LF=9 THEN LET C6$="J"
2450 IF LF=10 THEN LET C6$="K"
2460 IF LF=11 THEN LET C6$="L"
2470 IF LF=12 THEN LET C6$="M"
2480 IF LF=13 THEN LET C6$="N"
2490 IF LF=14 THEN LET C6$="O"
2500 IF LF=15 THEN LET C6$="P"
2510 IF LF=16 THEN LET C6$="Q"
2520 IF LF=17 THEN LET C6$="R"
2530 IF LF=18 THEN LET C6$="S"
2540 IF LF=19 THEN LET C6$="T"
2550 IF LF=20 THEN LET C6$="U"
2560 IF LF=21 THEN LET C6$="V"
2570 IF LF=22 THEN LET C6$="W"
2580 IF LF=23 THEN LET C6$="X"
2590 REM- LINES 2340 TO 2580 GENERATE THE SIXTH CHARACTER OF LOCATOR
2600 PRINT CHR$(147)
2603 PRINT
2604 PRINT
2605 PRINT
2606 PRINT
2607 PRINTSPC(12)"THE LOCATOR IS"
2608 PRINT
2609 PRINT
2610 PRINT SPC(11);C1$;SPC(2)C2$;SPC(1)LR;LD;SPC(1)C5$;SPC(2)C6$
2700 PRINT
2701 PRINT
2702 PRINT
2703 PRINT
2704 PRINT
2705 PRINT
2710 PRINT"PRESS '1' AND 'RETURN' TO WORK OUT"
2720 PRINT"      ANOTHER LOCATOR"
2730 PRINT
2740 PRINT"PRESS '2' AND 'RETURN' TO GET BACK TO"
2750 PRINT"      THE MAIN MENU"
2751 PRINT
2752 PRINT
2753 PRINT
2755 INPUT"                  ";Y%
2756 PRINT
2757 PRINT
2758 PRINT
2760 IF Y%=1 THEN GO TO 990
2770 IF Y%=2 THEN GOTO 100
3000 PRINT CHR$(147)
3001 PRINT
3002 PRINT
3003 PRINT
3010 DIM T(6)
3020 INPUT "  WHAT LOCATOR NEEDS CONVERTING";L$
3030 PRINT
3040 FOR J=1 TO 6: T=ASC(MID$(L$,J,1))
3050 L=ASC(MID$("AA00AA",J,1)):H=ASC(MID$("RR99XX",J,1))
3070 T(J)=T-L:NEXT
3080 E=(T(1)*20)+(T(3)*2)+(T(5)/12)-180+1/24
3090 N=(T(2)*10)+T(4)+(T(6)/24)-90+1/48
3100 N=N*10↑4
3110 N=INT(N)
3120 N=N/10↑4
3130 E=E*10↑4
3140 E=INT(E)
3150 E=E/10↑4
3200 PRINT SPC(6)"THE POSITION OF THE LOCATOR"
3210 PRINT SPC(11)"YOU ENTERED IS-"
3240 PRINT
3250 IF N>0 THEN PRINT SPC(5) N "DEGREES NORTH LATITUDE"
3260 IF N<0 THEN N=N*(-1):PRINT SPC(5) N "DEGREES SOUTH LATITUDE"
3270 PRINT
3290 IF E>0 THEN PRINT SPC(5) E "DEGREES EAST LONGITUDE"
3300 IF E<0 THEN E=E*(-1): PRINT SPC(5) E "DEGREES WEST LONGITUDE"
3310 PRINT
```

COMPUTER TRAINING FOR SPINAL INJURIES PATIENTS

When you have lost the use of all your limbs through paralysis, life can seem bleak and hopeless.

But in Britain, a pioneering Government-backed training scheme is bringing optimism, and a sense of purpose, to victims of severe spinal injuries by equipping them for new home-based careers using computers.

In 1982, as part of a long term national 'Information Technology awareness' programme, Britain's Department of Trade and Industry launched its 'Concerned Technology' scheme.

This imaginative initiative — also backed by the UK Government's Manpower Services Commission — provides occupational therapy, and where possible "remote working" (home-centred paid employment), for disabled people

Coincidentally, earlier the same year, the National Spinal Injuries Centre of the world-renowned Stoke Mandeville Hospital at Aylesbury, south-east England, had bought an Apple Two computer to enable a teenage patient to continue his examination studies. Before long, nine other spinal injury patients were taking part in computer instruction.

"At this point we were approached by the Department of Trade and Industry (DTI), to run a project as part of their 'Concerned Technology' initiative," explains Mr Michael Fountain, training officer at Stoke Mandeville. As a result, with 70,000 pounds funding from DTI, the National Spinal Injuries Centre expanded its workshop. Within two years, it was equipped with 11 personal computers — seven BBC machines (Acorn models used for a television instruction series), two 'Apples', and one each from IBM and 'Apricot'. This finance also enabled special computer-based training software to be developed.

Of the first 100 patients trained at the workshop, 52 were working on computers within one month of discharge from the unit. This included 38 tetraplegics — those paralysed in all four limbs. People with no movement below the neck were taught to operate computers by means of a mouthstick, while paraplegic patients — paralysed from the waist down — who had movements in their arms but not in their fingers, had two short sticks fastened to each arm to enable them to use a computer keyboard.

Among patients released from the Stoke Mandeville unit, 10 now work for pay in their own homes. One man does computer programming for British Petroleum, the company who employed him before his car accident. A former building apprentice runs an estimating service for builders and plumbers in his home locality. Another former patient helps her husband manage a public house, while also working 20 hours a week doing computerised accounting and word processing for neighbouring farmers.

from "Feature" 8 March 1985 **AR**

HIGH SPEED PRODUCTION PROGRAMMERS ARE EASY TO OPERATE

A range of high speed production programmers designed to load programmes into EPROM chips with minimal operator skills are now available.

The P-9000 range consists of three models, each with similar programme capabilities but differing features and facilities, and can programme all single rail EPROMs up to 27512 size (64k x 8 Byte). High-speed programming algorithms have been included in the range to reduce the programming time of large EPROM devices by up to over 90 percent over the standard 50 ms pulse method.

The range has many features usually found in more expensive programmers, including menu driven function and device selection, label printing facilities, RS 232 serial interface providing up to 16 formats as standard with user selecting speeds up to 19.2k Baud, powerful editing commands, and fail-safe systems and device tests. From "New Technology in Britain". **AR**

```
3320 PRINT
3330 CLR
3500 PRINT"PRESS '1' AND 'RETURN' TO DO ANOTHER"
3510 PRINT"         CONVERSION"
3520 PRINT
3530 PRINT"PRESS '2' AND 'RETURN' TO GET BACK TO"
3540 PRINT"        THE MAIN MENU"
3541 PRINT
3542 PRINT
3545 INPUT"               ";X%
3550 IF X%=1 THEN GOTO 3000
3560 IF X%=2 THEN GOTO 100
3930 PRINT CHR$(147)
3940 PRINT
3950 PRINT
3960 PRINTSPC(1)"NOTE-'A' IS SOURCE STATION"
3970 PRINTSPC(1)"    -'B' IS DESTINATION STATION"
3980 PRINT
3990 PRINT
4050 INPUT"STATION A-LATIDUDE IN DEGREES    ";AA
4060 INPUT"                   MINUTES    ";AB
4080 INPUT"NORTH OR SOUTH LATITUDE         ";AA$
4085 PRINT
4090 INPUT"STATION A-LONGITUDE IN DEGREES   ";AD
4100 INPUT"                   MINUTES    ";AE
4120 INPUT"EAST OR WEST LONGITUDE          ";AD$
4130 PRINT
4140 PRINT
4150 INPUT"STATION B-LATITUDE IN DEGREES    ";OA
4160 INPUT"                   MINUTES    ";OB
4180 INPUT"NORTH OR SOUTH LATITUDE         ";OA$
4190 PRINT
4200 INPUT"STATION B-LONGITUDE IN DEGREES   ";OD
4210 INPUT"                   MINUTES    ";OE
4230 INPUT"EAST OR WEST LONGITUDE          ";OD$
4300 AA=AA+(AB/60)
4310 AD=AD+(AE/60)
4320 OA=OA+(OB/60)
4330 OD=OD+(OE/60)
4390 PI=3.141592654
4400 AA=PI*AA/180:AD=PI*AD/180
4410 OA=PI*OA/180:OD=PI*OD/180
4510 IF AA$="S" THEN AA=-AA
4520 IF OA$="S" THEN OA=-OA
4540 IF AD$="E" THEN AD=-AD
4550 IF OD$="E" THEN OD=-OD
4600 DEF FNA(X)=-ATN(X/SQR(-X*X+1))+(PI/2)
4610 X=(SIN(AA)*SIN(OA))+(COS(AA)*COS(OA)*COS(OD-AD)):I=FNA(X)
4620 J=I*180/PI:REM-TAKES I IN RADS TO I IN DEGREES
4630 DS=INT(J*111.17):REM-GIVES SP DISTANCE
4640 DL=INT((2*PI*6367.45)-DS):REM-GIVES LP DISTANCE
4650 X=(SIN(OA)-(SIN(AA)*COS(I)))/(SIN(I)*COS(AA)):H=FNA(X)
4660 IFSIN(OD-AD)<0 THEN GO TO 4680
4670 IF SIN (OD-AD)>=0 THEN H=(2*PI)-H
4680 K=INT(H*180/PI):REM K=SP BEARING IN DEGREES
4690 IF H<PI THEN L=K+180
4700 IF H=>PI THEN L=K-180
4800 PRINT CHR$(147)
4810 PRINT
4820 PRINT
4830 PRINT"DISTANCE IN KM - SHORT PATH";DS
4840 PRINT"                - LONG PATH ";DL
4850 PRINT
4860 PRINT
4870 PRINT"BEARING IN DEGREES-SHORT PATH";K
4880 PRINT"                   -LONG PATH ";L
4900 PRINT
4910 PRINT
4920 PRINT"PRESS '1' AND 'RETURN' TO DO ANOTHER"
4930 PRINT"         CONVERSION"
4940 PRINT
4950 PRINT"PRESS '2' AND 'RETURN' TO GET BACK TO"
4960 PRINT"     THE MAIN MENU"
4965 INPUT" ";V%
4970 IF V%=1 THEN GOTO 3930
4980              GOTO 100
```

UNINTERRUPTIBLE POWER SUPPLIES PROTECT ELECTRONIC EQUIPMENT

A continuous power supply and power protection unit from Britain provides electronic office systems, including computers and word processors, with uninterrupted power during a power cut and also protects sensitive equipment from mains interference or surges.

Installed between the mains and an electronic system, Powermaster solves the power cut problems by providing an uninterrupted supply for up to one and a half hours after power loss. This provides the operator with time to complete the work in progress and transfer the information from the machine's working memory to a disk.

In addition, Powermaster also eliminates supply line disturbances such as voltage spikes, power surges or frequency changes and provides a clean AC supply with regulated and stable voltage and frequency. It therefore provides protection against variations in mains voltage and unpredictable power loss which can cause memory wipe-outs in microcomputers, word processors and telex machines.

A feature of the Powermaster is that it provides a 'no-break' supply, as the current is drawn continuously from the internal batteries and there is no switching over from mains to standby capacity. With other devices there is a switchover and it is this switching action which can cause problems for computers.

Under normal conditions the Powermaster batteries are constantly recharged from the mains. This means, in effect, the connected equipment is totally isolated from the mains.

From "New Technology in Britain"
AR

HAND-HELD MICROCOMPUTER FOR HAZARDOUS AREAS

The world's first truly hand-held microcomputer specially designed and fully certified to be safe for use in hazardous conditions in mines, paint stores, petro-chemical installations and on oil-rigs, has been developed by the Scottish mining engineers Anderson Strathclyde of Glasgow.

The hand-held CS21 was designed over the past year to act as an electronic notepad, portable data capture unit, work study terminal, calculator, calendar, stopwatch and electronic tape recorder.

Although designed for the routine monitoring of the condition of underground machinery the number of possible applications is limited only by the imagination of the user. For instance a geological survey company in Australia is using a CS21 in the hot and dusty conditions of the outback.

As versatile as a desk-top computer, the CS21 measures about 200 x 100 mm, weighs less than 1 kg, and is capable of withstanding the rigorous environment of coalface conditions and meeting the safety standards for working in explosion-hazardous areas.

A membrane keyboard with "click effect" keys and two liquid crystal displays are housed in an ABS plastic case which is sealed completely from moisture and dirt. The keyboard has 31 keys providing 61 functions via a full set of alphanumeric keys and additional symbol/function keys.

There are two liquid crystal displays, one with two lines of 24 characters, the other with two lines of 16 characters. The latter normally defines the four "soft-key" functions but can be used for general display. For example, the top panel can display instructions for the operator while the lower panel shows information as it is entered.

The unit can be equipped with a maximum of 128 kilobytes of memory and can be programmed in computer assembly language to suit particular application: it can also be supplied with basic language to allow programmes to be written by the user.

A small auxiliary battery maintains the contents of the memory when the CS21 is switched off or if the main battery pack runs down or is removed.

from Information Technology from Britain
AR

Around-the-World in Thirty Days

Graham Ratcliff VK5AGR
9 Homer Road, Clarence Park, SA 5034

The chain of events that led to an Around-the-World trip by Peter Frith VK7PF and myself began with a meeting in Cheltenham, England on the 15th of July 1984 when a paper, prepared by Jan King W3GEY, entitled 'AMSAT Phase 4 Concept' was first released. Ian Ashley ZL1AOX attended that meeting prior to travelling to Marburg, Germany to be endorsed by Karl Meizner DJ4ZC as a ground control station for AMSAT-Oscar 10. On his return to New Zealand Ian passed on a copy of this paper to Irving Spackman ZL1MO the AMSAT Region 3 Scientific and Educational Co-ordinator.

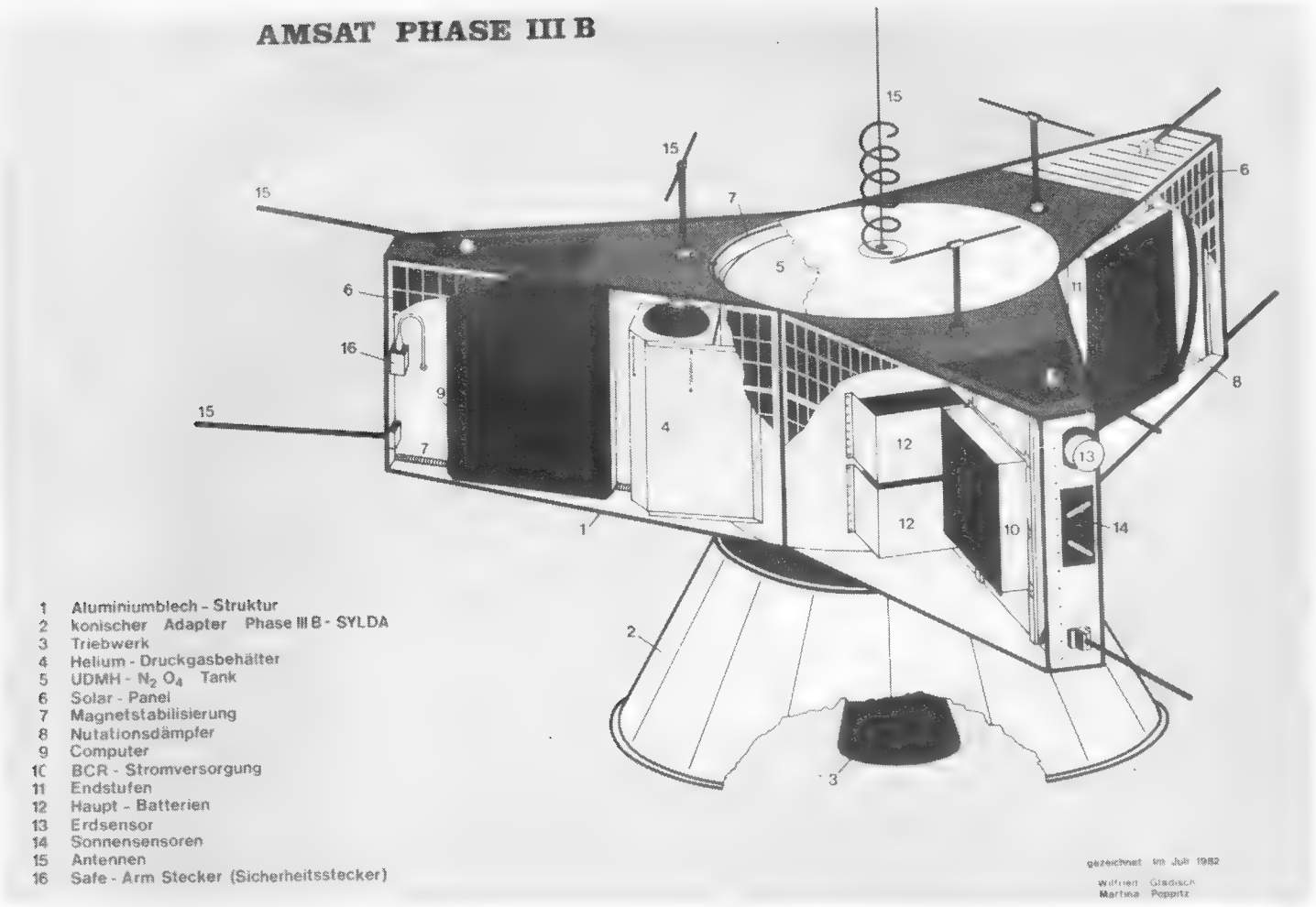
Irving was planning to visit Australia on his holidays in August so with the help of Alan Henessey VK2RX I arranged a meeting of AMSAT-Australia in Sydney and asked Irving if he would agree to be the guest speaker. Irving agreed and the meeting took place on the 15th of August at the Mandarin Club in the Haymarket area of Sydney. Twenty six interested individuals attended, 2 from VK1, 1 from VK5, 1 from VK7 and of course the remainder were from VK2. At the meeting Irving presented a general overview of amateur satellite activities in ZL and then gave an excellent presentation based on Jan King's paper. (A detailed description of the paper was published in the AMSAT-Australia column of the January 1985 issue of 'Amateur Radio'). Basically this proposed 'Phase 4' mission would effectively use the European Space Agencies (ESA) Ariane-4 launch vehicle (or a later launch) volume to place a constellation of a 6 satellites in geostationary orbit. If you take the trouble to read the above-mentioned article you will find that one of the suggested approaches to this project is that spacecraft #4 be co-ordinated by a group consisting of JAMSAT (Japan), AMSAT-NZ (NZART) and AMSAT-Australia (WIA). Another approach involved SA-AMSAT (South Africa), AMSAT-NZ and the WIA in the co-ordination of spacecraft #6. Although everyone at the AMSAT-Australia meeting was extremely excited about the concept, most wondered at what level of involvement Australian amateurs could have in such an ambitious project.

I approached the WIA Federal Executive to join the WIA as a member society of AMSAT, the Amateur Satellite Corporation with its headquarters in Washington in the United States. By the constitution of AMSAT any member society must be invited to nominate up to 2 nominees for the Board of Directors for which members vote just prior to the AGM which is held each year in November. As a result I was nominated for the 1984 elections. As in previous years a Technical Symposium was planned for the 1984 AGM, so I thought what better opportunity to find out what involvement Australia could have in the 'Phase 4' project than to attend the AGM and meet and discuss the project with the experts at the Technical Symposium/AGM.

The venue was the AMFAC Hotel in Los Angeles and on investigation of airfares I discovered that for $280 more than the return airfare to LA I could purchase an Around-the-World ticket. So after contacting Dr Martin Sweeting G3YJO (the leader of the group responsible for building and maintaining Oscars 9 and 11) at the University of Surrey in England and Dr Karl Meizner (the mastermind behind AMSAT-Oscar 10) in Germany I decided to take advantage of the Around-the-World ticket and visit both Martin and Karl. Unfortunately due to work commitments and financial restraints the trip would have to be completed within a 30 day period. The final step in arranging the trip was to see if any other amateur in Australia would be interested and willing to make such a personal financial commitment. Well Peter VK7PF agreed almost immediately to be travelling companion come technical adviser. One unexpected bonus but none-the-less most appreciated was a sponsorship of $750 from the WIA.

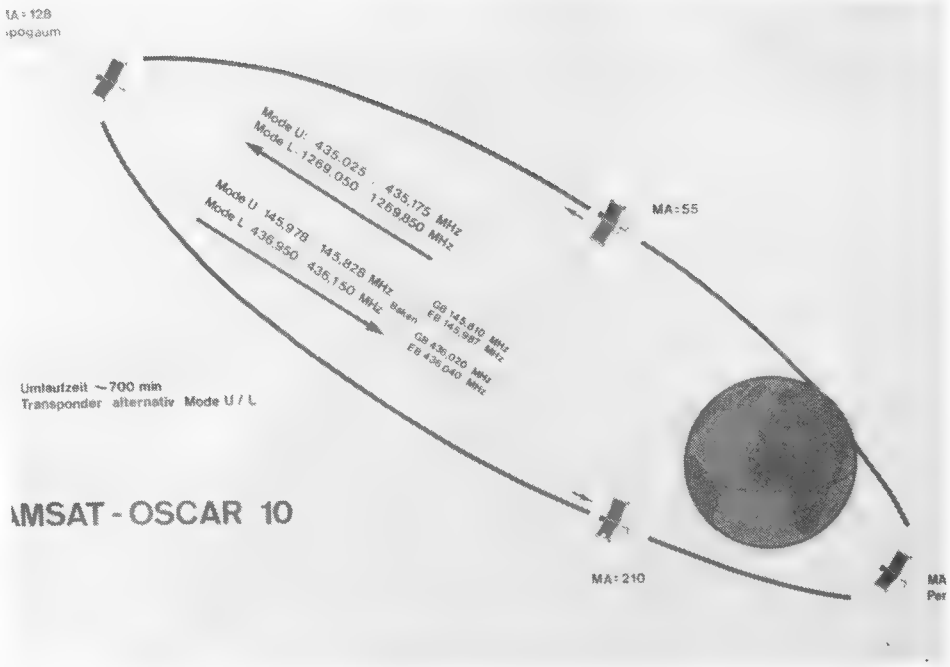
The first question most people will ask is whether or not the trip was worthwhile and the answer is an unqualified YES. Peter and I learnt an incredible amount of background information about amateur satellite activities in the past, present and well into the future. Our first stop was Los Angeles for the AMSAT Technical Symposium and the AGM.

The Technical Symposium commenced at 0900 and finished at 1700 with a break of one hour for lunch from 1200 to 1300. The first session was presented by Al Dayton KA4JFO, who described 'Advanced Gateway Concepts' whereby a group of amateur radio clubs and organisations would purchase a geosynchronous satellite, complete with several 'C' band transponders, and give access to the average amateur through numerous gateway stations. The gateways or teleports would serve large communities of amateurs using just a simple 2m FM handheld. Next, AMSAT Director Harry Yoneda JA1ANG presented a fascinating preview of the exciting JAS-1 satellite being built entirely in Japan by JARL and JAMSAT and scheduled for launch by NASDA, Japan's national space agency. The paper, written by JK1VXJ with technical assistance from JR1SWB, was translated and reported by JA1ANG. JAS-1 is due to be launched in February 1986 and will have two transponders, Mode JA anolog 2m up and 70cm down (same as Oscar 8's Mode J) and Mode JD that is a digital store and forward transponder utilising packet radio technology. Launched by the Japanese H-1 launcher (Japan's first experimental launcher), JAS-1 is expected to have a 1500km orbit with an inclination of 50 degrees. ARRL Technical Department Manager Paul Rinaldo W4ARI described progress in Amplitude Compandered SideBand (ACSB) techniques. Paul described initial experiments performed recently at ARRL HQ. He then explained Project Companion, a joint ARRL-AMSAT-Project OSCAR effort designed to encourage the use of the spectrum efficient ACSB technique on the amateur bands. Paul explained that by using special compression techniques, along with some other 'tricks', very substantial improvements in signal-to-noise ratio and intelligibility have been noted by land-mobile users of advanced ACSB radios. Tests performed by the Federal Communications Commission (FCC) both in the laboratory and the field, showed excellent results. Jim Eagleson WB6JNN and Paul Shuch N6TX showed several interesting graphs indicating quantitative improvements realisable with ACSB. Paul then played several taped QSOs dramatically showing the improvements of ACSB over conventional SSB. Jim pointed out that ACSB like FM had a pleasing quieting effect. He also showed some circuits he had developed for effective audio compression. Bob Diersing N5AHD followed with an excellent presentation on 'Computers and the Satellites'. Bob focused on the systems he has developed to track and decode the telemetry from the UoSAT satellites. After lunch a group from the World Space Foundation spoke on the Solar Sail Project. Introduced by AMSAT's John Champa K8OCL, were foundation president Robert Staehle, as well as Mark Bergham and Chauncey Uphoff. Each explained a different aspect of the Solar Sail Project including its history, purpose, initial tests, programme outline and some of the options that would rely on amateur radio for telemetry and communications. One would have the Solar Sail in a nearly geosynchronous orbit or alternatively in a lunar orbit. K8OCL explained the agreement between AMSAT and the World Space Foundation to explore means of co-operation in future projects. The next group presented a review of the latest happenings and progress on the PACSAT project. Speakers included Harold Price NK6K, Wally Lindstruth WA6PJR, Rick Fleeter WA8VGK, and Phil Karn KA9Q. Harold, PACSAT Project Manager, narrated a slide presentation that was (as is customary for NK6K) both entertaining and informative. WA6JPR described some of the experiments that he and others are performing in California. Fleeter discussed some of the propulsion motors being considered for PACSAT. This is an especially important aspect of PACSAT engineering since the anticipated Shuttle launch will be too low for PACSAT, it will need to be boosted up by several hundred kilometres. Phil Karn KA9Q, described progress on advanced modems and solicited help in designing PSK modems that will resist the anticipated radar interference the satellite is expected to encounter when in orbit. Martin Sweeting G3YJO, UoSAT Programme Manager, next summarised the status of both UoSAT-Oscars 9 and 11. He said that both spacecraft were behaving well and that UO-11 had been well stabilised, resulting in better link performance. A brief slide presentation showed the preparations that led to the launch of UO-11 last March. Tom Clark W3IWI, explained some of the economic factors that determine what projects can be built and what expenses AMSAT absorbs in order to keep the organisation running. Tom pointed out especially the cost of publications in terms of its proportion to the overall budget. Tom said that in round numbers AMSAT spends $250,000 annually, for all purposes. Bill Tynan W3XO, gave a progress report on future 'Ham-In-Space' activities. Bill noted that approval of the joint ARRL-AMSAT proposal for W0ORE to fly a suite of amateur radio equipment was thought to be imminent. Among equipment expected to be approved, according to W3XO, was a 2m scanning receiver, 2m to 10m scanning repeater, slow-scan television (SSTV) with a 10m downlink and other features. Bill said it appeared everything was in order for a 1985 flight of W0ORE but the exact date of Shuttle flight was not fixed at that time. Closing the technical programme, Vern "Rip" Riportella WA2LQQ spoke of future advanced satellite projects. Rip claimed that an appraisal of amateur radio indicates that the time maybe right to begin serious consideration of a system of geosynchronous amateur satellites for continuous global coverage. He cited some of the basic Phase 4 conceptual work recently completed by W3GEY (who was unable to attend) as well as the so-called gateway concept, examined earlier by KA4JFO and others. I have only summarised the topics discussed during the Technical Symposium

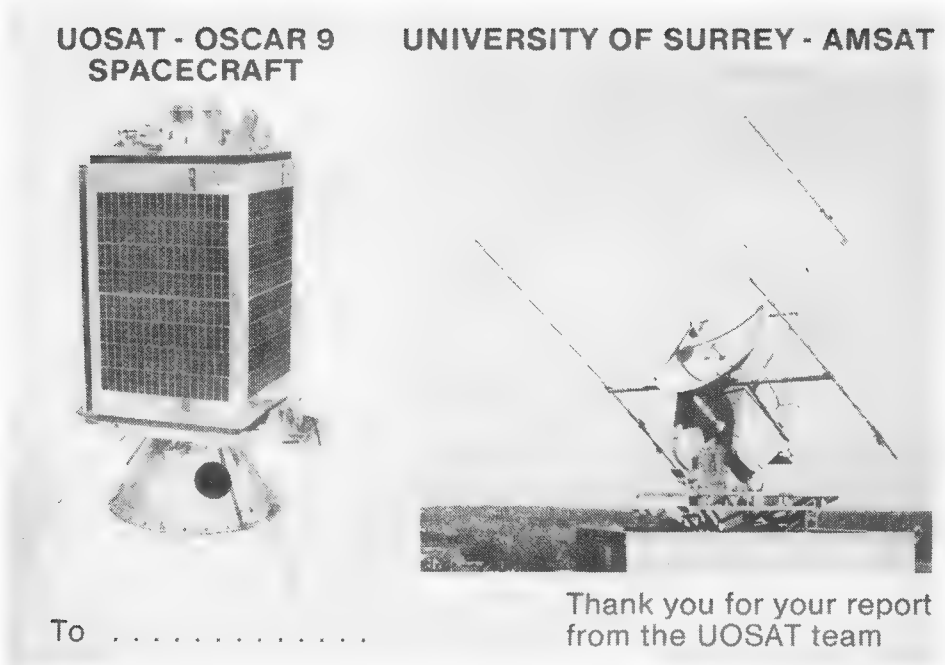


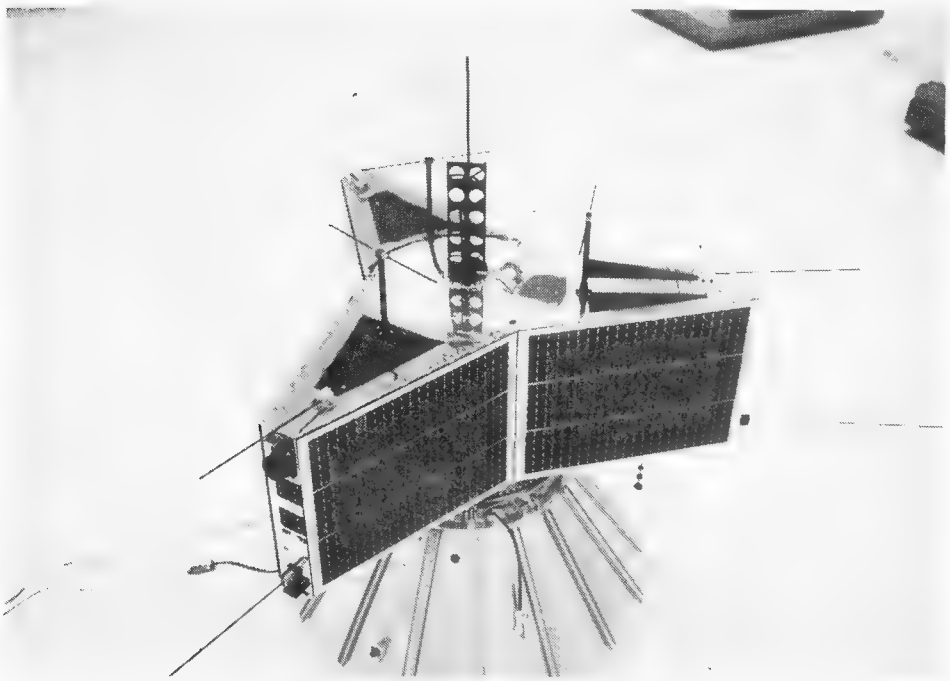
however, if readers would be interested in more information on any of the topics I recorded all seasons using a small handheld cassette recorder, despite its size it gave excellent copy, so if you would like to hear any particular session then send me a blank C90 cassette and sufficient to cover return postage. The whole symposium took six C90 cassettes. At the meeting a number of different handouts were supplied for the following presentations; Advanced Gateway Concepts, JAS-1, circuit diagrams for a Tx/Rx attachment to standard SSB equipment to evaluate the ACSB technique, and a brochure on the Solar Sail project. On one of the trade displays I found information concerning a satellite tracking programme for the Commodore 64 and the VIC-20, the cost of the programme and associated hardware is US$150. The hardware is a small interface card which plugs into the back of the computer and is connected directly to the controls of your Azimuth and Elevation Rotators for completely automatic antenna tracking.

The AGM was held immediately after dinner and went on until late in the evening. Tom Clark, the then President, acted as Chairman and conducted the meeting on a relatively informal basis starting with a description of the major achievements of AMSAT over the last four years. Then Bill Lazzaro N2CF (who was at that time the Manager of the AMSAT HQ office but is now employed at ARRL HQ) gave a status report on AMSAT finances which, to say the least, were a bit gloomy for the current year. With about a US$10,000 deficit for the past year and there had been no major expenditure on amateur satellite projects, only the cost of running the office itself. After a lengthy discussion period amongst those at the meeting it became very obvious that a number of alterations needed to be made in the future to ensure the future of the AMSAT organisation. One such alteration was the suggestion to do away with the glossy AMSAT publication 'ORBIT' and to replace it


Mode U: 435.025 - 435.175 MHz
Mode L: 1269.050 - 1269.850 MHz
Mode U 145.978 - 145.828 MHz
Mode L 436.950 - 436.150 MHz
Baken
MA: 55
Umlaufzeit ~700 min
Transponder alternativ Mode U / L
MSAT - OSCAR 10
MA: 210

with a more regular and informative newsletter at a hopefully much lower cost. Bill reported that there are now 5,500 members, an increase of 36 percent (I believe due to the success of AMSAT-Oscar10) on last year. In my opinion the main problem with the distribution of funds is that in an organisation with only 5,500 members one can not afford to have an office run by salaried staff, it needs to be run by volunteers. Until this procedure is adopted I cannot see how any worthwhile part of members subscription can be channeled into the building of amateur satellites. On the subject of funding future satellites it was





blatantly obvious from discussions held at the AGM that the large sums of money required to build and launch satellites could not be raised entirely from within the amateur ranks. In fact the majority of funds would almost certainly have to come from non-amateur sources such as big industrial concerns or possibly from foundation support. Unfortunately, the days of the 'free' launch and the building of satellites in garages are over. The figure most commonly bandied about for a satellite launch of the Phase III type is in the order of US$300,000 and this is regarded as being rather optimistic in light of information recently received from various launch authorities. Therefore a whole new approach is needed to funding satellites for amateur use and will almost certainly involve the prostitution of amateur radio to large industrial concerns to obtain the necessary funding. In the USA AMSAT is currently trying to raise money for the PACSAT project from foundations willing to support a project for the benefit of thirdworld countries. VITA, Volunteers in Technical Assistance, have already donated a large sum of money to AMSAT for the specific use of developing a system that will allow cheap reliable transfer of messages to and from third world countries using the minimum in equipment, complexity and cost. Similarly without the support of the German government I do not believe we would see the launch of Phase IIIC and in England without the support of British Industry the University of Surrey would have been unable to build and launch Oscars 9 and 11. Therefore without the ability to attract funding of the order of millions from outside the AMSAT organisation a project of the magnitude of Phase 4 has very little chance of a future, however, it was generally agreed by most that it would not be feasible this decade, but maybe a possibility in the 1990s.

After LA Peter and I flew to London and based ourselves at Stevenage about 20 minutes by train north of London at the temporary residence of Charles Mowle VK5ACM who is currently working for British Aerospace. From there we travelled by train to Dover and crossed the Channel by Hovercraft to Calais and then by bus to Brussels. On the next day we travelled by train to Marburg in Germany via Frankfurt. We stayed in Marburg for two days while awaiting the opportunity to meet with Dr Karl Meizner DJ4ZC. Karl spent most of the time with Peter and I discussing the future of the amateur satellite service as he sees it. For instance he has successfully negotiated with the German government to ensure that Phase IIIC is launched on board the Ariane-4 vehicle in 1986. Karl then went on to give us his personal assessment of the future of other proposed satellite projects throughout the world, in particular, PACSAT, Solar Sail Project and the future possibilities at the University of Surrey. We finally discussed the feasibility of the Phase 4 project, and as much as Karl would like this project to happen now but as I mentioned before he believes as do most that because of the level of funding required it will have to wait until the 1990s at least. So, at present, the group at Marburg will devote their energies to building Phase IIIC with its proposed high power (500W) Mode L transponder. The other news from Germany is that another group led by Hanspeter Kuhlen DK1YQ (also an Oscar10 command station) is planning to fly a packet radio experiment on Phase IIIC based on the Tuscon Amateur Radio Terminal Node Controller (TAPR TNC) with its AX.25 protocol. Peter and I had hoped to be able to see Phase IIIC in its early stages of construction but unfortunately it was still neatly packaged in silica gel storage until it is required for the integration of the various modules it will carry aloft in 1986. However, Karl did give me a copy of a booklet on Oscar10 with some excellent photographs as seen in this article. We also received some copies of the original drawings for AFDEM PSK demodulator and Bit Regenerator for decoding the PSK telemetry on Oscar10's beacons. Another gift from Karl was the listing and associated instructions for a satellite tracking programme Karl wrote for the Sharp PC1245 pocket calculator (computer). The programme is extremely concise and Peter VK7PF is currently modifying it to run on the Tandy MC10 colour computer with only 4k of RAM. If you are interested in this or any other information I obtained while overseas please write to: AMSAT-Australia, C/- Box 1234, GPO, Adelaide SA 5001. (Please include sufficient to cover return postage.) The calculator/computer and the programme make a rather unique approach to tracking Oscar10 in that all you have to do is key in the date and time you want to look for the satellite and it will tell you if it is in view and at what azimuth and elevation, at the same time it can tell you whether the satellite is in view at another location providing you know the longitude and latitude.

After leaving Marburg Peter and I did a few days of sightseeing as we wound our way back to London. Once again we travelled by train to Munich via Frankfurt and spent 2 days there. One whole day was spent at the Deutsches Museum which, for the scientific at heart, would have to be an experience of a lifetime. To view all the exhibits you would have to walk a total of 16 kilometres so you can imagine we only saw about half of the exhibits and then it was only a cursory glance. You could literally spend days and still not absorb everything. We did however cover the sections concerning space, aviation, marine, engineering and the telecommunications. Probably the most amazing find was a full scale model of AMSAT-Oscar10 in glorious colour amongst the display of the many famous commercial satellites in the space section. The main aim of the Museum was to familiarise the general public with the exact sciences and with the technology which is based on them. This has been successfully achieved by the design of many of the exhibits so that the general public can actually get hands-on-experience with the current equipment used in today's technology. My final comment is that no one should visit Munich without seeing at least some of the exhibits at the Deutsches Museum. Also while in Munich I attempted to meet up with Hanspeter DK1YQ who, as I mentioned earlier, is a command station for Oscar 10 and the leader of the group building a Packet Radio module which will hopefully fly in Phase IIIC. Unfortunately our contact was restricted to a rather lengthy phone call. However it was most interesting to find that in the Munich area alone there was in excess of 30 amateurs using the TAPR TNC for local Packet Radio. We concluded our

conversation with a promise from Hanspeter to keep me informed on their progress with the Packet Radio module for Phase IIIC.

From Munich it was on to rainy and flooded (hightide) Venice via the famous Brenner Pass through the Austrian Alps which were covered in picturesque snow. Because of the rain in Venice, other than a quick trip around the canals, we headed off for Geneva. We decided to stay in Geneva for a couple of days before the longest day of our trip back to London. One of those days was spent visiting the sights in Charmonix in France, in particular the cable car ride up 3960 metres to view the adjacent peak of Mt Blanc. After lunch we took a ride on a rack and pinion train to view the local glacier in all its glory.

The following day was by the far the longest and most eventful of our entire overseas trip. It began with us getting up at some ungodly hour of the morning to catch the 0700 TGV (famous high speed train) from Geneva to Paris. After arriving in Paris at 1000 we caught the underground to the station from which our train to Calais was due to leave at 2230 that evening to deposit our luggage prior to seeing the sights of Paris. The next 10 hours were spent either walking around Paris or commuting on the unbelievably overcrowded underground. Of course no trip to Paris would be complete without a visit to the top of the Eiffel Tower (274.3 metres). If you would like to use the Eiffel Tower as an antenna sight you would be about 100 antennas too late. As very tired travellers we boarded our train to Calais only to have Peter's suitcase stolen from under our noses (it was no further than 3 metres away from where we were sitting) about 30 minutes prior to the train departing. After a futile attempt to locate a Gendarme to report the theft we left for Calais. No-one in authority on the train was interested in our tale of woe nor on the ferry across the Channel and it was not until 0530 on the next morning when we arrived at the Dover Docks that we found an ever reliable English 'Bobby' who was only too happy to take a report of the theft and document it for insurance purposes. At 0630 the train left Dover arriving in London at 0845 and after a brief stop in London to check with the owners of the Paris train service we headed by train to Stevenage, our base in England, for the next week. We arrived in Stevenage at around 1030 and promptly slept for the next 12 hours. What a day (and a half)??

On Sunday, after a relaxing couple of days of English village life, we decided it was time to start 'work' again namely back to meeting people involved in amateur satellites, so we set off by car to Cambridge to visit James Miller G3RUH who has made himself famous by writing two articles for the magazine 'Wireless World'. The first was a circuit for decoding the UoSAT telemetry and was published in May 1983. The second article published in October 1984 was a PSK Demodulator for the telemetry on Oscar-10. The unique feature of both these designs was their simplicity and excellent performance characteristics. The visit to meet James was primarily to have a look at the performance of the AO10 PSK demodulator and the associated BBC software for displaying the telemetry, the results were outstanding compared to those obtained using the original AFDEM design by AMSAT-DL which had been built here in VK from some rather questionable quality photocopies. Not only was the hardware good but the software was equally impressive. If anyone would be interested in a copy of the article then send an SASE to AMSAT-Australia. James also had a novel design for a helical antenna which was not only functional but rather robust to say the least. An article on this should appear in 'Wireless World' in the not too distant future. Another interesting piece of information that we obtained from James was a copy of his Oscar 10 satellite tracking programme which prints out an extra item of useful data which he calls the 'Squint Angle' which is basically the amount that Oscar 10's antennas are offpointed from the centre of the earth during the orbit. James, from experience, has learnt that for optimum communications ie best signals and minimum 'spin modulation' the 'Squint Angle' should be less than 30 degree. Copies of this BASIC programme are also available from AMSAT-Australia for an SASE. James also had many other interesting tid-

bits of information to offer and if you have the opportunity to visit England he would be well worthwhile adding to your itinerary.

Monday was our only free day left to see the sights of London so back to playing the tourist for a day including voting at Australia House. Once again we took advantage of the Underground to transport us from one tourist spot to the next. The itinerary was, I am sure, all too familiar to anyone who has been to London, namely the Tower of London, London Bridge, Parliament House and Buckingham Palace.

The next 3 days were spent entirely at the University of Surrey with Dr Martin Sweeting and the members of the UoSAT team. Even though the group was not currently building a satellite and therefore not madly rushing about trying to put a satellite together in a record time of 6 months as they did with UoSAT-2 (Oscar 11) they were certainly not idle. Neville Bean G8NOB is almost fully occupied running the UoSAT Control Station for the maintenance Oscar 9 and 11 and of course the operation of the onboard experiments. What little time that Neville has free from the above duties is devoted to programming either the satellite on-board computer or the University's mainframe for handling the management of satellite tracking or data reduction. The UoSAT Control Station has developed over the last few years into quite a sophisticated automatic system for tracking and commanding satellites as well as the collection, storage and handling of masses of satellite telemetry. This automation has been forced on the UoSAT team to enable them to spend the maximum amount of time investigating the success of their satellite production techniques by careful evaluation of the received telemetry. I must admit that I was somewhat disappointed by the level of automation because I had some romantic notion that someone had to be actively involved in the data acquisition procedures, however I can certainly appreciate the need for such a system in their environment. Unfortunately it has set me thinking about setting up such a system in my own shack so that, like the UoSAT Team, I can spend more time finding out the significance of the data rather than collecting it. If anyone would like to experiment with automated tracking and data acquisition I have collected quite a lot of useful information on techniques from UoS (and Bob Diersing N5AHD in Texas) and this is available for the asking. Other activities that were currently in progress at the UoS were the development of an improved automatic satellite tracking system using a BBC microcomputer, development of a 9600 Baud PSK (Phase Shift Keying) modem for

high speed data transfer to and from UoSAT-2 in conjunction with the onboard Digital Communication Experiment (DCE) and the Charged Coupled Device (CCD) camera. Another interesting project that had already been completed before the launch of UoSAT-2 was a 2m repeater consisting of a Kenwood handheld and a Yaseu FT480R located in the Electronics Workshops at UoS to enable most of the members of the team to be in contact wherever they were 24 hours a day. The main purpose of the 2 rigs was that there was a constant need to change the repeater input/output frequencies to avoid outside interested but time-consuming listeners.

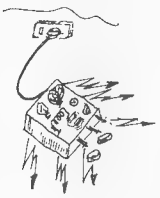
For those who have the ability to decode the 1200 Baud ASCII telemetry from UoSAT-1 and receive the weekly news bulletin you may be interested to know the rather lengthy procedure involved in getting that excellent service on Oscar 9 each week. The procedure starts early on Friday morning with either Martin or Neville sitting down at a terminal hooked to the UoS mainframe and putting together about 32K characters of text for uploading later that afternoon. The information is sourced from Telemail (the international electronic mailbox used by the worldwide co-ordinators of AMSAT), letters/news items from users of the Bulletin, news of the week's happenings at the UoS, and many other sundry places such a 'Amateur Satellite Report', AMSAT-DL, AMSAT-UK, etc. Using a word processing package the information is strung together and edited to approximately the required size (there is only a finite size of memory available on UoSAT-1 for the Bulletin). The resulting file is then passed to a programme on the mainframe that formats it so that it is suitable for anyone receiving the Bulletin using a 64 character/line terminal, then the file is passed to another programme which imbeds the text with the appropriate machine code to upload the text and execute it once it has been successfully uploaded to the spacecraft. Unfortunately if the text is only one Byte too long the text has to be culled and the whole process repeated and Martin says it is amazing how many weeks the text is within 1 or 2 Bytes of the available space. The procedure to this stage with the usual inevitable interruptions takes at least a couple of hours. The next step of the procedure is uploading to the spacecraft. Step 1 involves sending up the appropriate command to ready the spacecraft to receive the Bulletin file that is on the UoS mainframe computer. Step 2, assuming that the uplinking command has succeeded, is to ready the UoS mainframe (not always easy on Friday afternoon when staff and students are flat out typing up the wekly reports/assignments before the weekend). Step 3 is to uplink the bulletin file to the spacecraft which is very interesting to watch as it is a full duplex operation in that the ground computer receives a memory map from the onboard spacecraft computer showing those blocks of memory that have received error free data. Having made one pass the procedure is repeated to fill in only those areas not successful during the previous pass. This procedure is repeated until all the file has been successfully received. Bearing in mind that it takes a little longer to uplink this file than it does for you to receive it, so as you can imagine during a single pass this would not be a bad achievement. Another problem is that you must leave sufficient time for Step 4, that is to send a further command to start the beacon transmitting again. Often the 4 steps cannot be achieved in one pass so that it can sometimes happen that the satellite appears with no beacon at all until after the next orbit over UoS.

The remainder of the Friday at the UoS Peter and I spent with Martin discussing the future of the Amateur Satellite Service as seen in his opinion. His views were very similar to those expressed by Karl and reflect the everpresent problem of obtaining funding and launch opportunities. At that time Martin was investigating a number of options which included involvement in building PACSAT, Phase IIIC and a number of purely British Industry type projects. Martin was confident that the UoS would be shortly back in the process of building another satellite with at least some amateur involvement. Finally, Martin agreed to listen to any proposal for Australian involvement in any future projects at the UoS provided that they fitted in with the design criteria. He also promised to keep us in mind for any project that may need outside sources for the appropriate expertise, time and/or funding.

After a restful weekend in Stevenage with a further trip to Cambridge to visit James Miller and a sightseeing trip to the home of William Shakespeare at Stratford-upon-Avon we left London on Monday for home via Bahrain and a one day stopover in Singapore for the inevitable shopping spree before arriving back in Australia on Thursday the 6th of December just 30 days after leaving.

AR

TRANSFORMERLESS POWER SUPPLIES



Bruce Hannaford VK5XI

One of the attractions of voltage multiplying power supplies is that they CAN be used straight off the power supply mains without any transformer. I emphasise the word CAN and I am NOT saying I recommend this practice. Using such supplies will often greatly reduce the weight, size and cost of equipment using valves. The most popular circuits are those having one AC input and one DC output terminal common as this can then be earthed. It is possible of course to design equipment with both DC output terminals above earth but this will complicate construction and is rarely used.

I refer to such supplies as Death Trap Supplies (DTS) and think the name is most appropriate. Those who insist on using such supplies should consider at least the following points. A normal 240V AC supply to a home will consist of a two wire feed, one wire at earth potential and the other 240V above earth, the earthed wire is called the neutral and the above earth wire the active. In some districts, States etc, depending on the supply authority the neutral will be connected to earth at each installation but in other cases it will only be earthed at a few points here and there with no direct connection between earth and neutral wires at each installation.

The first obvious danger of having one side of the mains connected to the metal chassis of your equipment is that you might at some time get the neutral and active feed reversed thus making the whole equipment and anything connected to it 240V above earth! Of course you check first to see it is right-way-round but strange things sometimes happen. You may for example use an extension lead that has active and neutral connections reversed, or some double adapters have one outlet side reversed (for convenience in manufacture). Far less likely you might for a short time get 240V above earth active fed into your normally neutral supply wire! I have been around long enough to know of and experience several cases where this has happened by accident. Let's be kind to Supply Authorities and their staff and just say this can happen if a truck hits a pole and an active wire falls on a broken neutral wire supplying your house.

Some DTS users get cunning and don't connect the neutral to the chassis of their equipment at all but instead rely on the earthing pin of the power supply lead. A two way switch is used as a mains on/off switch for the DTS the common of this switch is connected to the above earth side of DTS and the power lead to the equipment active and neutral are connected to the other contacts of the two way switch. Regardless of which way the active and neutral arrive at the switch one way will be above earth and the other will be earthed. A reversed extension lead etc will just mean the on/off positions will be exchanged. Provided the equipment is properly earthed the supply will switch on and off and operate with no problems.

No more problems with reversed actives and neutrals, yes indeed but even worse problems have been created. The AC power supply to the equipment is now dependent on the earth wire of the three wire power cord and/or any other leads earthing the equipment. Let's say the house installation earth wire is defective, your RF earthing system will take over and carry the AC needed to run your DTS and if you removed or accidentally knocked off this wire with the supply switched on then there will be 240V between the equipment case, and all connected to it, to earth. The whole system is just waiting for someone to touch something connected to it and complete the circuit to earth! With no RF or equipment direct earthing the defective house installation earth wire will also be 240V above earth (in some older installations it is a bare wire) so someone touching a tap or something in contact with the defective earth wire may get a 240V shock. Many installations made years ago depended on the metal water pipe system to act as an earth, however in this plastic age some of the metal pipes may have been replaced by plastic pipes and the earthing may no longer be effective in fact it might well be a hazard

Quite apart from the lack of safety using an earth return circuit to draw power from the mains this will no doubt incur the wrath of the supply authorities if they find out you are doing it. Additionally if you were unfortunate enough to have a house fire involving your equipment and the insurance people found out your equipment was wired in a dangerous and/or illegal way quite likely they would blame your equipment and not pay up. Yet another factor with DTS is that when in use they sometimes cause hum problems in other equipment being used at the same time, this is especially so with the earth return system.

Those who insist on using such supplies should in my opinion observe at least the following:

Don't use the earth return system. Have two 240V neon lamp indicators wired between both incoming power leads and earth, say a green one for the active and a red one for the neutral, with this if the power is right way round the green will light and if reversed the red will light. A double pole switch should be used breaking both leads after the neons mentioned earlier, the equipment side of this switch going to two fuses one for the active and one for the neutral. It is normally bad practice to put a fuse in a neutral but in this case it is needed for protection with reversed active and neutral. The neutral fuse should be at least twice the rating of the active so it will not blow first unless active and neutral are reversed. Of course the metal case of the equipment MUST always be connected to an effective earth and this NEVER disconnected while power is being supplied to the equipment.

I hope I have convinced all that very careful consideration is needed before using any such DTS and I repeat I do NOT recommend them.

AR

LIZARD ISLAND BASE FOR CAIRNS AMATEUR RADIO CLUB

Anne Benson VK4FAB
22 Cassia Street, Edge Hill, QLD. 4870

The Cairns Amateur Radio Club took part in the John Moyle Field Day Contest on 23/24 February 1985 from remote Lizard Island. It all began whilst chatting over an NQ Stubby (locally brewed beer) after a normal monthly meeting . . . Roger Kimeklis VK4JB said "Anne, you and I ought to see if we can go to Lizard to operate during the John Moyle Field Day Contest". "Oh yeah," I said, thinking it was a bit of a joke. However, he was serious about it and we thought why not charter an aircraft so a few of the members could set up camp and for the first time, compete as a club in the contest; and so the seed was sown! Roger and I, both working for the air company who operate the service to the island, made the arrangements for an aircraft etc, which was a little easier to undertake, being on the spot.

With all arrangements eventually made, we were ready for our exercise, but alas, firstly cyclone Pierre then Rebecca hard on its heels made it a "stop — go" affair and it was not until the last minute, 7.40 am, at the Cairns airport on Saturday 23 February did we know it was a "goer". The Captain, Alan Hutchinson and First Officer (and Club member) Roger were ready — the Traffic Officers had the Twin Otter loaded, and it was all aboard for Lizard Island.

Lizard Island is situated 250 kms north of Cairns (94 kms north-east of Cooktown) or for those nautical people, 135 nautical miles from Cairns (50 from Cooktown). The flight was along the coastline with wonderful views of the tropical rainforest from Cape Tribulation to Bloomfield, with the Captain pointing out all points of interest during the entire journey. There were great views of the huge silica sand deposits at Cape Flattery north of Cooktown, then on to Lizard Island, surrounded by the most beautifully coloured water imaginable. On landing we were told of the latest weather bulletin which, because of cyclone Rebecca, meant we may have to return to Cairns without making camp, but we were to await the next report. Finally at 12.40 pm came the all clear, so then the trek to the campsite began. During this waiting period we had temporarily erected a radio station beside the airstrip, not wanting to waste time and the first contact was made at 12.16 pm local time. We then dismantled the station, with troops carrying marquee, poles, esky, generators, battery, heavy barbecue plate, personal gear, table, stools, coax, aerial, HF rigs, etc, etc. All this in very strong winds made erecting a camp quite difficult.

Arrival at Lizard Island. The "Twin Otter" is in the foreground with "Cook's Look" towering above.

Awaiting the weather report on LI.

Temporary transmitting site whilst awaiting the all clear with the Wx. From left — Phyl VK4JFA (partly hidden) Roger VK4JB, Colin VK4EX and Anne VK4FAB.

Living conditions were a far cry from those at the luxurious lodge on the island, but members of the Cairns Amateur Radio Club are quite used to roughing it during their operations in conjunction with the State Emergency Service and all is taken in their stride. There were eight licensed operators on a roster system during the contest hours and all were pleased with the number of contacts, taking into consideration the rather poor band conditions.

Operators were Colin Swinburn VK4EX (Club President), Phyl Le Grand VK4JFA, Allen Jacobs VK4BAJ, Ted Gabriel VK4YG, Ron Petrich VK4ACZ and his XYL Gwen VK4AZC, Roger Kimeklis VK4JB and Anne Benson VK4FAB. There were fifteen in the group including aircrew, one of which, of course, was Club member Roger VK4JB.

Lizard Island had another couple of overnighters some 214 years ago, namely James Cook and Joseph Banks — and here we were on this historic island sending signals instantly reaching their destination hundreds and thousands of miles away — we wondered how long it took Captain Cook to get a message back to England in those days! The island also became known through the tragedy of Mrs Mary Watson and her baby son Ferrier. The family lived on the island where Mr Watson was a beche-de-mer fisherman and whilst away fishing in September 1881, hostile aboriginals attacked those left behind and Mrs Watson, baby Ferrier and a Chinese servant fled in a tank they used for a boat. Sadly they died of thirst and exposure and were not found until January 1882 on an island in the Howick group. The remains of their cottage stills stands in what is now known as Mrs Watson's Bay.

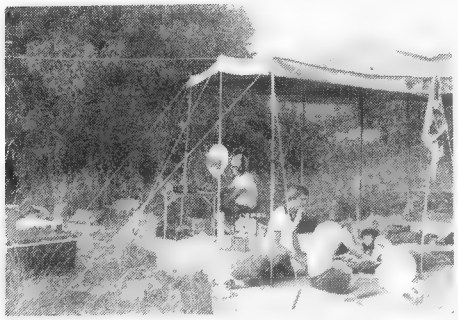
The remains of the Watson cottage.

Lizard Island is now known more pleasantly as a stepping off place for the big marlin fishing which lures fishermen from all parts of the world, swimming, snorkelling, coral viewing or just relaxing completely away from it all.

The station, VK4HM operated till about midnight then one by one the ops dropped into bed and had a few hours sleep in spite of the very gusty conditions prevailing but awoke at first light to find the wind had died down, then it was back to work again. When we completed our 24 hours stint it was time for playing and we found the sea very inviting and extremely difficult to remove ourselves from it once we were in. However,

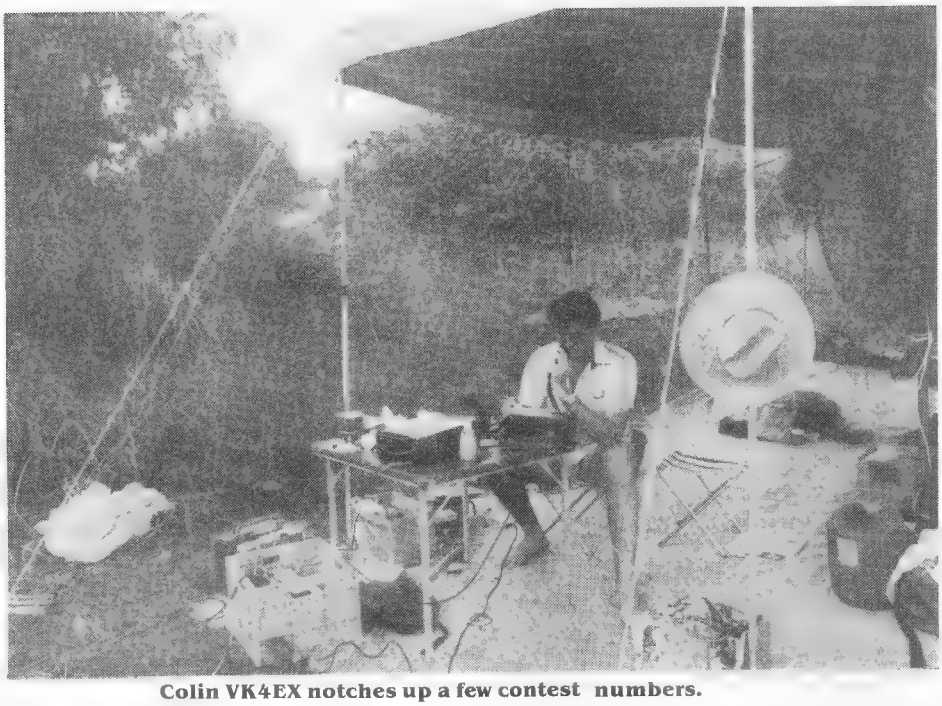
A windmill on the island was handy for an aerial support.

there comes a time for all things to end and time was fast approaching to pack up and head back to Cairns. This time we didn't have our T/Os to load the aircraft but Murphy wasn't around and all was put back in place and we were ready for take-off at 4.45 pm Sunday. The flight back to Cairns was absolutely magnificent (can't find enough superlative adjectives to explain it) and to those, and that was most of us, who had never flown over the Great Barrier Reef or Outer Reef, it was the experience of a lifetime and will live for a long time in our memories.



Ted VK4YG "pounding the brass" whilst others relax before their operating stint.

Going camping in the Far North of Queensland during the wet season is always a bit risky, but we were told that to think of going camping at Lizard Island at this time was madness — well, the layman might say madness, but we are Amateur Radio Operators and we call it dedication and were proud to partake for the first time as a club, in the John Moyle Field Day Contest and it has whetted our appetite to continue to take part in the future and who knows at what exciting destination we will be next year?? It certainly will be hard to beat this one — it was not all hard work, we did find time for swimming, walking, etc and came home tired, a bit grubby, very sunburnt but oh so happy to have enjoyed such an experience.



Colin VK4EX notches up a few contest numbers.

Though we were quite remote (perhaps the most remote location in the Contest?) we were well catered for in the food line, thanks to Sharon, XYL of Colin VK4EX. Sharon took her Novice study material with her, but was too busy catering thus having no time for study, so it's head down and tail up for Sharon for a while. A wonderful exercise, great weekend never to be forgotten, thanks to members, friends and especially the Air Queensland crew.

Technical data: *Transceivers: Kenwood TS130S, Yaesu FT757GX*
Power: 12V battery
Generators: 2 Honda 350W (1 used for battery charging, 1 for lights)
Contacts: 70 (24 hour period) CW and Phone

Aerial: Black CTW — up 25 feet.

Footnote: *I advise anyone contemplating a "radio safari" by aircraft to make arrangements well ahead in order to have enough people to fill the seats. We had several necessarily drop out for various reasons, but we were determined to do this trip, and by golly we did it. Also, charged batteries are not allowed in aircraft, so we had to take an acidless one and were told we could get acid from the Lodge on the island — however, we found they had none, but we let out a sigh of relief when they said they had a spare we could borrow for the time we were operating — whew — all would have been in vain except for the kindness of the gentleman who tried to find us acid. Also generators must be completely devoid of petrol before being carried on aircraft. No pressure packs — liquid insect repellent or cream is a must.*

AR

BILL AND THE HAMAD

Ted Holmes VK3DEH
20 Edmunds Street, Parkdale, Vic. 3195

Bill sat at his dust-strewn desk, licking the end of his pencil thoughtfully. It had a peculiar taste and he suspiciously inspected the tip. It was the indelible type and purple. So was the end of his tongue. He threw it away and grabbed another pencil. Bill was in the throes of composition.

"For Sale. Set of bowling balls, complete with bag. In very good condition, apart from one ball requiring attention" etc.

He had decided to give the bowling away. The incident at the club a few days earlier had been the last straw. How was he to know that size nine boots were not supposed to be worn on the green during competitions? Anyway, it had been pretty mean of the club to exclude him from the competition, considering the progress he had been making to date. He had learned not to hit the jack more often than he could avoid and it wasn't really his fault the whole thing had to be called off because of the condition of the green. Sometimes things were very unfair.

Now he was selling up his bowling paraphenalia and had decided to get some radio equipment with the proceeds. His old gear was in a terrible state. His tattered wire dipole had fallen into shreds and his 2 metre apology for a Slim Jim was bent at an angle of about 45 degrees. He had quite a bit of work to do in order to get back on the air. Meantime, he was determined to get his shack into some kind of order.

A few days earlier he had responded to a Hamad and had arranged to see the vendor in a few moments time. He was going to buy another rig. The person concerned was calling round with the rig and Bill was getting quite excited about it. There was a ring on the front doorbell.

Bill opened the front door and was confronted by a man carrying an FT 101E. The man stared oddly at Bill's purple stained mouth, but said nothing. Bill ushered him into his shack and again the man said nothing. It was as though he had been struck dumb. He laid the FT 101E on Bill's desk top, after sweeping a few things aside.

Bill looked at the rig, suppressing any excitement he felt. Not a good idea to let on that he was at all interested. He asked the chap to plug the unit in, which he did. This was accomplished with some difficulty, since the power point was festooned with an assortment of two way plugs. Bill screwed a PL 259 plug into the back of the rig. Finally came the moment the rig lit up.

Unthinkingly, Bill pressed the microphone push-to-talk switch. Suddenly, all the lights in the rig died with a quiet sort of spluttering noise. Bill was mystified. Then it dawned on him. He had forgotten about the condition of his dipole and had keyed full power into it!

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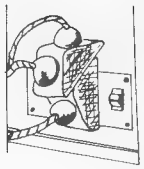

ELECTRICAL SAFETY IN THE AMATEUR SHACK

Fred McConnell VK3BOU

Safety is of paramount importance and every precaution should be taken to ensure equipment used is perfectly safe, not only for the operator, but other members of the household, or visitors. It should be possible to turn off the power to the entire station by one master isolating switch, located in a very prominent position. All members of the household should know that this switch must be turned off before touching anything.

Ultimate in shack safety would include:-

1 *Power to the shack via a separate connection on the premises main switchboard, via what is known as sub-mains.*

2 *Core balanced earth leakage protection either in the main switchboard or the sub-mains to the shack.*

3 *The shack would have its own sub-switchboard with the following:-*
   (a) Location — prominent and readily accessible
   (b) Control isolating switch (double pole).
   (c) Core balanced earth leakage protection (if this is not already provided on the main switchboard).
   See Item 2 above
   (d) Final sub-circuits power (at least 2) to control 240 volt power outlets.
   (e) Final sub-circuit light (one) to control shack lighting
   (f) All final sub-circuits protected by either fixed setting circuit breakers or high rupturing capacity fuses.
   (g) In addition to a sub-main earthing conductor from the main earthing system of the premises, it is recommended suitable earthing electrode(s) be driven into the ground adjacent to shack and bonded to the earthing system at the sub-switchboard.

4 *Fixed wiring, that is all sub-mains, final sub-circuits, switchboards, outlets and luminaires should only be installed by a registered electrical contractor, who is a licensed electrician.*
   If the shack is a detached outbuilding, then the sub-mains would be installed underground with the correct cable, conduit and depth (minimum depth for metered sub-mains being 300 mm cover).

5 *Station layout is a matter of personal choice, but care is required to ensure all 240 volt mains operated equipment is connected via approved plugs and sockets and flexible cords are double insulated type.*
   Equipment known as being extra low voltage (ELV) operation (the common 13.8 volt range of gear) should only be connected with approved connectors suitable for extra low voltage. This is to ensure ELV plugs cannot be inadvertently inserted into 240 volt outlets.
   Layout should also consider the requirements of separation and segregation of outlets. Keep 240 volt and other high voltage outlets clear of any ELV and antenna coaxial outlets.

6 *Equipment including home brew gear if mains operated should include the following:-*
   (a) Control, via double pole switch
   (b) Fusing, in both active and neutral of supply lines.
   (c) Transformers should be double wound isolating type, one that gives complete isolation between primary and secondary windings. The screening plate between primary and secondary windings must be effectively earthed
   The use of auto transformers, one with a common winding but different voltage tappings and no isolation, should be avoided
   (d) There is always the great danger of making inadvertent contact with live metal parts and connections of equipment. Only training and a constant awareness of the hazard involved in working on live equipment reduces the possibility of electric shock
   (e) High voltage filter capacitors require care when handling Even when out of circuit they can still retain the capability of producing lethal discharge currents at their terminals. Capacitors with a voltage rating of 2,000 volts and a storage capacity of less than 10 microfarad can develop lethal capabilities when left in storage without first placing a short circuit across the terminals.
   An important design and construction feature of high voltage power supplies is the use of suitable bleed resistors placed across filter capacitor terminals.
   (f) The Standards Association of Australia wiring rules require that, for 3 core flexible cables, the following colours be used to identify conductors:-

Active — Brown
Neutral — Blue
Earth — Green/yellow stripe

WHAT IS CORE BALANCE EARTH LEAKAGE PROTECTION?

It is a device used with an automatic circuit breaker, that will open a circuit automatically on the detection of a predetermined level of fault current flowing to earth

They are known as core balance earth leakage circuit breakers and used to safeguard against fatal electric shocks.

The author is uncertain of their origin, but believes they have been in use in this country for 20 years and before in the UK and the mining industry of South Africa. They have gained the popularity they so justly deserve and are manufactured here by an increasing number of companies under different trade names

Principle of Operation:

When a current greater than 30 milliamps flows through the human body for longer than 1/10 second, the heart is affected and ceases beating. The earth leakage, core balanced circuit breaker is interposed between the supply and the operator, acting as a monitor of minute current variations in the load. If a current flows to earth it bypasses the core and upsets the balance of flux. This out of balance is detected and amplified, then used to trip the supply circuit breaker.

Total time of operation is less than half the normal fatal time, therefore giving the greatest measure of protection. The sensitivity of 20 milliamps is low enough for protection but high enough to eliminate nuisance tripping that may occur from "normal" leakage from a variety of causes.

Current operated earth leakage devices are only able to protect against electric shock caused by a current passing through a person's body to earth.

While this is by far the most common cause of fatal electric shock, it's of course still possible to receive a shock by coming into contact with both active and neutral conductor, or two active conductors on different phases.

These conditions will not trip any earth leakage protection device because the circuit formed is still balanced.

WARNING ABOUT EARTH LEAKAGE DEVICES

Even though a high degree of reliability can be expected, 100 percent effective operation may not always be achieved.

The State Electricity Commission of Victoria (SECV) in its leaflet "Earth Leakage Devices (current operated, core balance relays)" said there had been a small number of cases where these devices had failed to operate.

It advises the devices be periodically tested according to manufacturer's instructions using a simple in-built test facility. The SECV warned that use of the device should never encourage complacency. The usual safety precautions must always be observed.

EARTH LEAKAGE PROTECTED 240 VOLT OUTLET

Available through the electrical trade is a 240 volt double combination flush power outlet that incorporates earth leakage protection. This outlet gives all the required protection and has the added advantage of protecting against earth leakage from other outlets on the same final sub-circuit This outlet could replace an existing one in the amateur shack and give low cost protection

ELECTRIC SHOCK

The severity of electric shock depends on:-

1 ***The current***
   Various researchers throughout the world have established the following figures for 240 volts:
   1-3 milliamps — can be felt.
   10-15 milliamps — hard to let go.
   Above 50 milliamps — heart affected, flutters and does not pump (fibrillation).
   About 5 amps — current paralyses nerve centres in the heart.
   Heart is clamped and resumes pumping when current removed.
   The SECV in its leaflet "First Aid for Electric Shock Victims" says electrical currents may:-
   * *Stop the heart.*
   * *Cause the ventricles to fibrillate.*
   * *Cause contraction of the muscles of the body.*
   * *Paralyse breathing due to paralysis of the centre of respiration in the brain.*
   * *Cause burns.*

2 ***The Time***
   Time of contact for fibrillation to occur is related to the heart's cardiac cycle and a ratio of time and current. Listed are figures from graph characteristic curves:-

Current I (Milliamps)	Time T (secs)
25	5.75
30	4
50	1 45
100	0 36
190	0 1

   A time of 0 1 seconds is considered the minimum time required

3 ***The Path***
   The above figures are for contact from hand to hand, hand to foot or head to foot, where the current path passes the heart and respiratory centres Contact from foot to foot is less severe

CURRENT RESISTANCE AND VOLTAGE

It has been found from studies that, for 50 cycles, the resistance figures are constant under the skin, through fat and tissue, at about 600 ohms. The resistance of the skin varies from person to person, and depends on the moisture and condition. It can be as high as 2,000 ohms, and the accepted minimum figure is 500 ohms from hand to hand, or for a body in a conducting fluid about 200 ohms For a 240 volt to earth system, the current would be 0.48 amp for the minimum condition. The body resistance at low voltages varies to that at high voltages, and the accepted maximum "safe" voltage is about 25 volts.

SUGGESTED FURTHER READING

The SECV leaflets mentioned in the above article — similar material is available from other electric supply authorities. Heart and lung resuscitation technique for electric shock victims can be found on the inside back cover of the Australian Radio Amateur Call Book.

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EQUIPMENT REVIEW

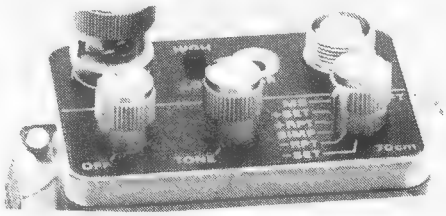
Kevin Phillips VK3AUQ
52 Hereford Road, Mount Evelyn, Vic. 3796

YAESU FT-708R

This is a new 70 cm hand-held transceiver from Yaesu. It features microprocessor control of most functions. This unit is designed as an FM only unit for simplex or repeater use. Power output is 1 watt on high, or about 200 mW on low power. When used with the quarter wave whip antenna supplied, it was more than adequate to operate four repeaters from the Box Hill and Mount Evelyn areas of Melbourne. Other antennas can be used easily.

Frequency coverage is in 25 kHz increments from 430.000 to 439.975 MHz. It has the standard 5 MHz repeater offset available as standard, but if for any reason another shift such as 1.6 MHz is desired, then it can be programmed into it. Up to ten memory channels can be programmed into it, and it has a Lithium cell to keep the memory going for at least five years. All frequencies are entered from the keyboard on the front.

Other features include a variety of scanning modes, such as full band scanning with automatic hold on either busy or clear channels, limited band scanning, memory scan, and it can also exclude a segment on its scan. It can also have a priority channel which it will periodically check.



Top view.

Digital display is provided by an LCD unit displaying the last four digits. This is a practice that irks me personally, as I like to know the full frequency. If I see for instance 7025, or 7.025 as it would be on this unit, I tend to think of 40 metres and 7.025 MHz. The same comment applies to all transceivers that give only a partial display of frequency — many manufacturers do the same thing.

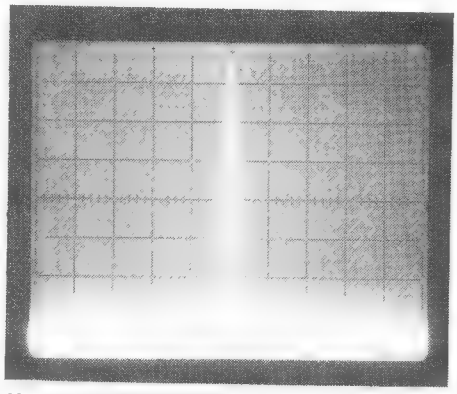
Controls provided are volume, squelch, Tx split switch, High/Low power switch, keyboard for frequencies etc, and a PTT switch. It also has a lamp switch to illuminate the LCD at night and a keyboard lock to prevent accidental change of channel.

Semiconductor line up includes 7 ICs, 5 FETs, 33 transistors and 33 diodes. They are all crammed into a package 168 by 61 by 49 mm, and a fair percentage of that space is taken up by the Nicad battery pack. Weight is approximately 720g.

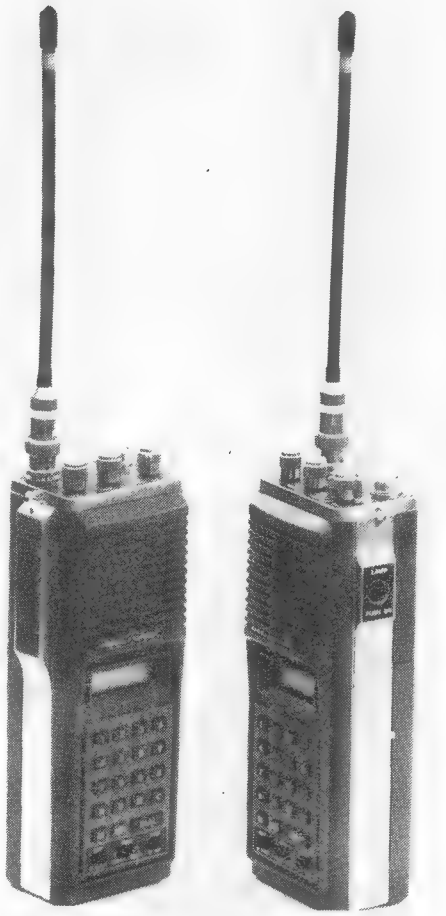
Receiver is a double conversion superheterodyne type with a first IF fairly high at 46.255 MHz, and second IF at 455 kHz. Sensitivity is quoted as being 0.4 μV for 12 dB SINAD. I measured 14 dB at .4 μV, so it was better than the specifications.

Selectivity is claimed as $\pm$ 15 kHz at -60 dB. Audio output is 500 mW maximum, which is more than adequate for most needs.

Transmitter output is switch selectable at 1 watt or 200 mW. I did a check with a radiation hazard checker at distances from the antenna that an operator's head would be, and found it to be at a safe level when on high power. Deviation is set to 5 kHz. Spurious outputs are claimed to be better than -50 dB, and was measured at -60 dB as the worst one. Output is generally quite clean.



How the FT-708R looks on a spectrum analyser.



Side views showing the PTT and lamp switches.

This unit uses Phase Lock Loop technology. It generates a VCO signal at 127.915 — 131.240 MHz, and mixes it with a crystal oscillator at 126.240 MHz. The difference of 1.675 — 5.00 MHz is then fed to a programmable divider with division ratios of 201-600, which produces basic 8.333 kHz steps for the synthesizer. There is also a 5.333 MHz oscillator which is divided down to 8.333 kHz, and the two 8.333 kHz signals are fed to a phase comparitor, and any difference produces an error voltage which is then fed back to the VCO at 127.915 — 131.240 MHz. When the VCO is multiplied by three it comes back to 25 kHz steps.

The VCO output is split two ways. For the receiver it is simply multiplied by three and fed to the first mixer, producing an IF of 46.255 MHz. Signal for the transmitter is first mixed with a 15.4183 MHz frequency modulated crystal oscillator, and then filtered and multiplied by three to the final frequency.

Power requirements are met with a nominal 10.8 volt battery pack. Maximum voltage is 13 volts, so it would be unwise to operate this unit directly from a car battery as most cars can produce voltages above 14 volts. Current consumption is about 20 mA when muted, 150 mA at full audio out and 500 mA on high power transmit.

Plug-Pack Charger.

The review unit was supplied with a plug pack charger, but it was not the Yaesu one. It was one of the Dick Smith units that have polarity reversal and a multi-way plug on it. If it were mine, I would cut off that plug and fit a standard charger plug. Fortunately the transceiver does have polarity protection on the charge input, but not on the external power socket.

The unit can be operated while charging, but as the charge plug enters from underneath, it becomes inconvenient to put it down base first. Side entry would have been better for such use, but as Yaesu also have accessories in the form of table top chargers and power supplies, I guess it doesn't matter.

The handbook supplied was of good standard, providing details of how it works, maintenance data, parts list and circuit diagram. Accessories provided are a rubber whip antenna, Ni-Cd battery pack, carrying case, shoulder strap, and earphone. The review unit also came with the optional external speaker/microphone (YM-24A) which allows the operator to hold the transceiver high under weak signal conditions, and also allows easy base station operation.

Overall impression of this unit is that it is well built, works well, and has a definite use now that 70 cm repeaters are getting to be numerous. It is worth looking at if you are in the market for a UHF handheld.

This test unit was kindly supplied by Dick Smith Electronics, to whom further enquiries should be directed.

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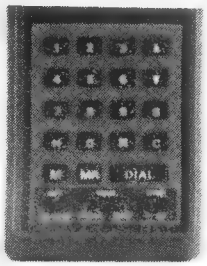
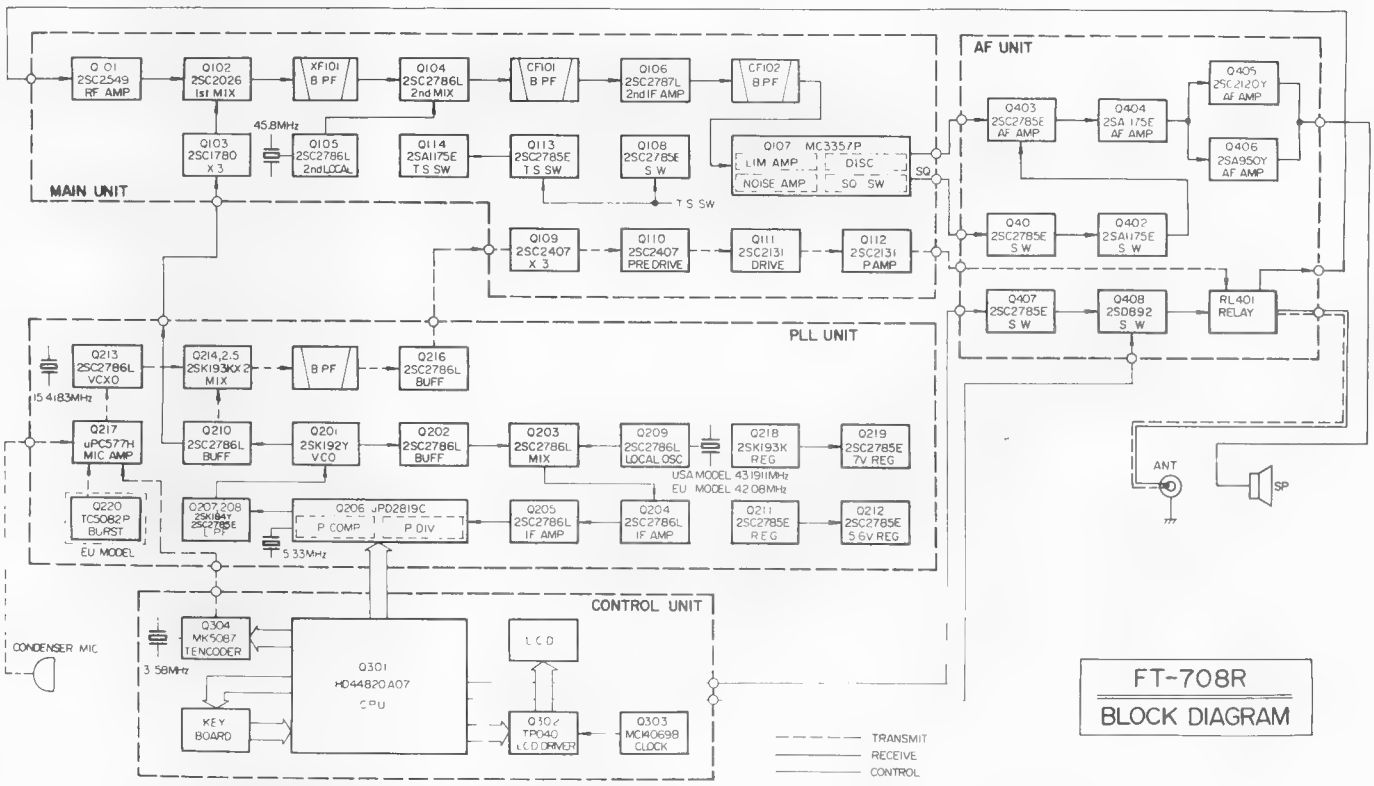


Keyboard Panel.

BLOCK DIAGRAM



QSP

NEW ERGONOMIC KEYBOARD SAYS GOODBYE TO "QWERTY"

Complaints by telex operators at the Australian Post Office have led to a British-produced computer keyboard which completely changes this one part of the equipment based on a layout more than 100 years old.

The operators said that using the keyboards all day caused pains in the neck and shoulders, and the resulting investigation by Sydney experts has been used to design the PCD-Maltron ergonomic keyboard.

The keys are divided into two well separated groups, with each key at a different height to allow for the varying lengths of the fingers. This means that the hands can be held straight, instead of close together with the wrists turned outwards, the usual position which leads to tension, and so to pain.

And the inevitable QWERTY arrangement of the keys, inherited from the typewriter, has also been changed. This layout was designed to stop the most used letters jamming together, but as this cannot happen with computers, the letters have been set out so that the most used are all adjacent. The left "home row" now reads ANISF and the right DTHOR, with E, the most used letter in English, being pressed by the normally underworked left thumb.

Ninety percent of the 100 most used words in English are on the home rows — with the addition of E — and the result, say the makers, is an increase in operating speed of between 20 and 40 percent.

The space between the two main sets of keys means that more use can be made of the thumbs. In addition to pressing the E key, the left thumb controls the "left" and "up" arrows, while the right governs the "right" and "down" movements and the return key, which normally has to be reached by stretching the little finger.

Operators are said to have no trouble adapting to the new keyboard, which can be attached to many computers. But for those who cannot learn where the letters are the QWERTY layout can be provided.

from Information Technology from Britain.

AR

IN THE SHACK.

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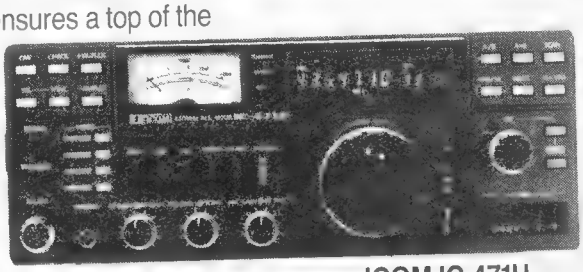
Based on ICOM's proven high-tech designs, the IC-751 is a competitive class HF transceiver. Continuous tuning receiver (100 KHz to 30 MHz) and a full featured multi-mode Amateur Band transmitter ensures a top of the shelf spot in your shack.

ICOM IC-751
With the optional internal AC power supply model IC-PS35, the IC-751 becomes one compact package. Ask for a brochure and compare the features now.



75 Watt 430 MHz – 450 MHz Base
This multi-mode UHF transceiver is packed with all the outstanding features you expect from ICOM. 75 watts RF output and wide dynamic range low noise receiver put the IC-471H in a class of its own.

ICOM IC-471H
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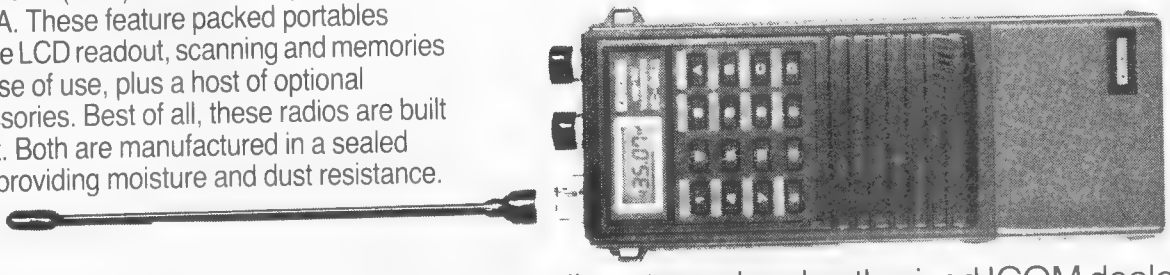
ICOM's legendary reliability works for you in the IC-02A (VHF) and the UHF portable IC-04A. These feature packed portables include LCD readout, scanning and memories for ease of use, plus a host of optional accessories. Best of all, these radios are built to last. Both are manufactured in a sealed case providing moisture and dust resistance.

IC-02A and IC-04A



Check out these and other ICOM radios at your local authorised ICOM dealer.
Write for product catalogue today.

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AR85

ALL SPECIFICATIONS ARE TYPICAL ONLY

REPEATERS — Friend or Foe!

PART 3

Tim Mills VK2ZTM
PO Box 204, Willoughby, NSW, 2068.

Permission for 2 metre repeaters came just over 20 years after the Australian amateur was allowed access to the band. The first permitted use of the band appears to have been 1st May 1948. It replaced an allocation at 166 MHz, which in turn had replaced an allocation at 112 MHz.

In the period after World War I the amateurs were pushed out of the 'useful wavelengths' (round the present AM broadcast bands) down to the "useless 200 metres" (1500 kHz.) and below. Once the benefit of the 'short wave' frequencies were recognised, international planning began. This resulted in bands for the 'experimenters' in harmonically related steps, in larger portions than today's HF allocations, the amateurs received segments at 160, 80, 40, 20 and 10 on HF (15 came after WWII) and on VHF there was 5 (56 MHz) and 2½ (112 MHz). Whetner we had 1¼ metres in Australia I do not know, but I expect that the American (Region 2 allocation) 220-225 MHz band may have originated from these harmonic steps. I have seen a reference in old publications to a small portion near 400 MHz. 56 MHz has been lost to Ch 1 TV, 112 is now in the international allocation for Aeronautical Radio Navigation, and 166 is in the high band commercial allocation.

The granting of 2 metres (144-148 MHz) continued the second harmonic related band allocation concept. This thinking appeared to have been that amateurs had harmonics, so give them harmonically related bands and anything they generate will fall in their bands, causing trouble only to themselves. Besides 2 metres, the Australians received 1 metre, 288-296 MHz and ½ metre 576-585 MHz. 1 metre has since been lost (military sub band region) but 50 cm is hanging on in the UHF TV band (Ch 34) under Australian footnote AUS 30 in the ITU Table of Frequency Allocations. (quote) "The band 576-585 MHz is also allocated to the amateur service until such time as the band is required for use by the broadcasting service" — 50 cm is very useful for ATV and is frequently the output frequency for ATV repeaters. (Currently the Institute has a dialogue with the Department of Communications for similar alternative allocations when this frequency is required.)

1 metre was a band that I had little to do with so I invite those who did to write a history about it. There is one story I do remember which goes back many years in VK5 land. It appears that in the late 50s there were about 70 limited licenses issued in VK5. 288 was a very active band — superreg receivers and mod osc transmitters — with over 200 (limited) call signs logged. Word was spread that the authorities were to undertake a 'shack inspection' of all users on 288 and activity suddenly dropped away.

2 metres is an international band but in Region 1 (Europe and Africa) it is 144 to 146 MHz. Region 2 (America's — north and south) and Region 3 Asia, (includes Australia) it is 144 to 148 MHz. Since WARC 79 however, some Asian countries have taken portions away for commercial use. Many countries make use of amateur intended equipment for commercial and military purposes Next time you see TV news footage of — for example — Middle East events, usually where they show officials in groups, study the handhelds. Amateurs involved in military service in these areas are no doubt able to acquire an adequate range of captured or found amateur transceivers and handhelds Amateur equipment is reliable and cheap, so a large portion of production may never see the inside of a shack

We are a lucky country in that there is little crowding of amateur allocations compared to other parts of the world. Region 1 for example, has 2 MHz at 2 metres. There are 10 — 2 metre repeater channels, starting at 145.000, 25 kHz spacing with 600 offset up The repeater band stops on the lower edge of the international satellite sub band — 145.800 to 146.000 MHz. (In 1972 the old channel "B" 146.000 was dropped from the Australian band plan because of possible interference to this segment.) Region 1 simplex channels are centred round 145 500 MHz. Europe is only a small place. Some years ago West Germany, for example, had 112 x 2 metre repeaters alone sharing those 10 channels, with all their neighbours on the same channels.

Now to return to the Australian scene. After Wodonga in 68, it was not until 1970 that permission began to appear for submissions made in 1968. Based on the two channel concept 1 and 4, VK2 had made to the following allocations. Channel 1, Orange, Gosford and Wollongong. Channel 4, Sydney and Newcastle. It soon became apparent that there was going to be massive interference problems on the shared channels but it was not until late 1974 that VK2 made the change.

Across the Tasman, New Zealand had developed repeaters. Their commercial two way system was AM and used the allocation round 100 MHz. (The FM band). As this equipment became surplus it found its way to 2 metres. They developed AM repeaters. Input was round 144.700 with outputs 1.125 MHz higher at 145.825 MHz. There were 3 channels. When they started into FM repeaters they chose a 700 kHz offset, some apparently preferred a MHz. Their system developed when Australia was in heavy debate on 500 and 600 kHz offset. New Zealand has now chosen the international 600 offset using the same channel positions as Australia, below 7000 in minus offset and plus above. Their channels are those ending in either 00 or 50 for repeater and those ending in 25 or 75 for simplex, centred round 146.5 and 147.5 MHz — there were 15 repeater and 7 simplex channels developed in the early 80s. On 70 cm they have also followed the Australian allocations. They have set aside 6 channels for repeaters and 4 for simplex. The repeater allocations start at 438 500 MHz output with a 5 MHz minus offset to an input at 433.500 MHz The 6 channels are each 50 kHz to 438.750. The simplex however are at 433.300, 433.350. 433.400 and 433.450 MHz. (Australia has 439.000 ± .250 MHz for its simplex.) The New Zealand channels are 3 figures for repeaters. The Australian 7000 becomes 700 in New Zealand or 438.500 becomes 850. On two metre simplex they use 4 figures, eg 146.475 — their prime calling channel is 6475. On 70 cm however they appear to use 3 figures — 433.300 is 330

The Australian policy for 70 cm repeaters is to use channels ending in either 25 or 75. VK2 has the extra policy not to allocate any 00 or 50 channels east of the Great Divide so that the ZL channels remain in the clear. The reason for 25 or 75 will be told in a later episode for it was not until 1975 that 70 cm repeaters were introduced The 2 metre turmoil in the early 70s was yet to be overcome.

Can anyone help with background material or articles on the old bands of 56, 112, 166 and 288 MHz? Please send anything that you might have to the address above. Thanks.

AR

RADIO CHESS

This CARI Group must be a cult of religious nuts — One's talking of maybe sacrificing a Bishop????
FBI COUNTER-INTELLIGENCE INTERCEPTIONS

CARI (Chess and Amateur Radio International) is a group of radio amateurs who regularly meet on air to play chess. Interested amateurs are invited to call in on any of the VK/ZL nets which are as follows:

Monday 1000 UTC	*145.575 MHz*
Tuesday 0930 UTC	*3.620 MHz*
Thursday 0930 UTC	*3.620 MHz*
Saturday 0330 UTC	*14.267 MHz*
Sunday 0330 UTC	*14.267 MHz*
Sunday 0930 UTC	*3.620 MHz*

Contributed by Craig McMillan, VK3CRA Secretary, CARI (Australia)

AR

RECEIVING!!

A Dutch engineer has developed a device costing about $50 which apparently can locate, receive and reproduce text typed on a computer terminal within one kilometre.

The device could result in terminals handling confidential information being screened which might include use of a sophisticated faraday cage.

Wim Van Eck, from the Dutch Neher Telecommunications Laboratory, demonstrated his device at the third world congress for the protection and security of information technology and communications in Cannes, France recently

It was based on the fact each cathode ray tube emits unique rays that are similar in principle to an individual finger (or screen) print.

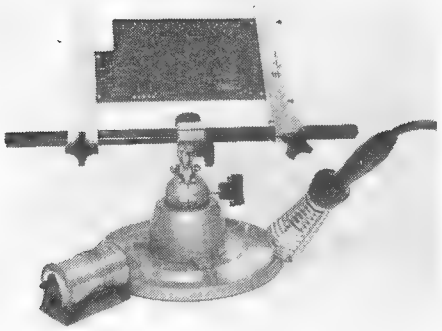
The device receives these rays and reproduces them on an ordinary television screen or could be recorded using a VCR.

Although the technique was already known to military specialists this was its first public demonstration.

AR

from Collector & Emitter, January 1985.

AR SHOWCASE



PORTABLE PCB REPAIR STATION

A new PC board repair station has been released under the Scope-Panavise label.

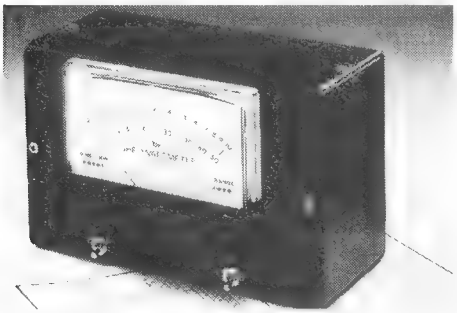
Features include —

- *an adjustable spring loaded board holder with a 300 mm capacity (larger capacity bars and multiple set of arms available)*
- *180° rotatable swivel and lock base*
- *stable tray base with wiping sponge, non skid-feet and parts recesses.*
- *solder reel dispenser*
- *safety stand to accept any iron less than 15 mm barrel diameter.*

Anticipated trade price is $115.00 excluding solder and the Scope Model TC60 temperature controlled iron. This iron has been designed as a portable soldering station to operate direct from 240 V mains with 2 percent accuracy from 20°C-400°C.

For further information ring — (03) 338 1566 and speak to Kay Quinn.

AR



K 6312 UHF WATTMETER KIT

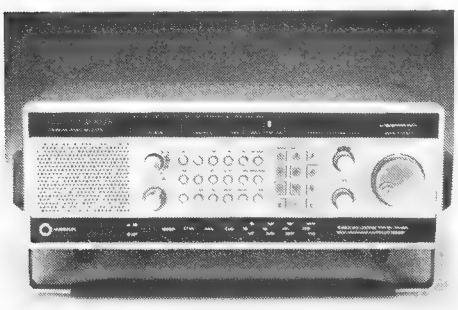
Dick Smith Electronics proudly introduce the K 6312 UHF Wattmeter Kit into the Australian market

The UHF Wattmeter Kit provides the economical solution for radio enthusiasts wishing to make accurate RF power measurements. The unit relies primarily on its strip line layout for reproducable accuracy.

Retail price for the K 6312 UHF Wattmeter Kit is $49.95. The kits are now available in all Dick Smith Electronics Stores throughout Australia.

For further information contact: Wendy Giles Public Relations Manager, Dick Smith Electronics Pty Ltd. Phone: (02) 888 3200

AR



DX 1000 COMMUNICATIONS RECEIVER

There has never been an easier way to hear what the world has to say. The new "Bearcat" DX 1000 allows you direct access to the world.

Featuring microprocessor controlled digital technology, DX 1000 covers 10 kHz to 30 MHz continuously, with PLL synthesised accuracy. Yes, that's right! Reception down to 10 kHz. The DX 1000 has ten memory channels to allow for instant recall-or for faster "band-scanning" during key openings. The digital display measures frequencies to 1kHz, or at the touch of a button, doubles as a two time zone, 24 hour digital quartz clock.

The DX 1000 can be programmed to activate peripheral equipment, also, record up to five different broadcasts — any frequency, any mode.

The DX 1000 also includes IF bandwidth selection to help you to separate high powered stations on adjacent frequencies.

The DX 1000 is NOW available at Dick Smith Electronics stores throughout Australia

AR

D 1404 HAND-HELD VHF MARINE TRANSCEIVER

Just released through all Dick Smith Electronics stores throughout Australia is the D 1404 Hand-held VHF Marine Transceiver.

These units are very compact and provide the diode programming for frequency selection without a need of additional crystals. The D 1404 is high quality for marine craft using from 156 MHz to 162 MHz.

The battery pack slips into the bottom of the radio easily, and various battery packs are available to suit needs for optimum size and longer use.

Features:- 0.5/2.5 W transmitter output power (switchable), High Sensitivity: better than 0.25 uV (12dB SINAD), Capable of all VHF marine channels.

Units come fitted with Channels: 6. 16. 8. 12. 67. 70. 71. 72. 73. 74.

Complete with Nicad battery, No crystals to buy.

For further information contact: Wendy Giles, Public Relations Manager, Dick Smith Electronics Pty Ltd. (02) 888 3200.

AR

HX 2000 HAND HELD SCANNER.

Dick Smith Electronics has available in all stores throughout Australia the new HX 2000 AM/FM Programmable hand held scanning monitor receiver.

Performance is as good or better than from most "fixed" scanners but with the added bonus of being a hand held unit.

Features include:-

20 Channel memories — for full coverage and easy selection

No Crystals Required — Your choice of over 15,000 frequencies just by pushing a button.

7 Bands

Search and Scan — Scan frequencies you have entered or search for exciting new frequencies.

Crystal Liquid Display — Sidelight for night use.

SPECIFICATION:

60	90 MHz (VHF Mid)
118	136 MHz (Air band)
138	174 MHz (VHF Hi)
466	490 MHz (UHF)
490	525 MHz (UHF "T")
Search Frequency increments	
VHF	5kHz, 10 kHz, 12.5 kHz
UHF	12.5 kHz
Sensitivity (12dB Sinad, at tune-up)	
Mid VHF	0.5uV
Hi VHF	0.5uV
UHF	0.7uV
Air band	1.0uV (10dB S/D)

For further information contact: Wendy Giles, Public Relations Manager, Dick Smith Electronics Pty Ltd. (02) 888 3200

AR

NEW COAXIAL SWITCH

Now available from Dick Smith Electronics is the CH 20A Coaxial Switch.

The CH20A is a single pole two output position type coaxial switch.

This unit has been carefully engineered and manufactured under severe quality standards, and will give you satisfactory and dependable operation for many years.

Features: Professionally engineered double cavity layout. Professional RF characteristics.

a negligible insertion loss.
b negligible cross talk.
c super wide frequency range.
d low standing wave ratio.

Mechanically stable switching mechanism and contacts.

For further information contact: Wendy Giles, Public Relations Manager, Dick Smith Electronics Pty Ltd. (02) 888 3200.

NEW MOBILE ANTENNA MOUNT

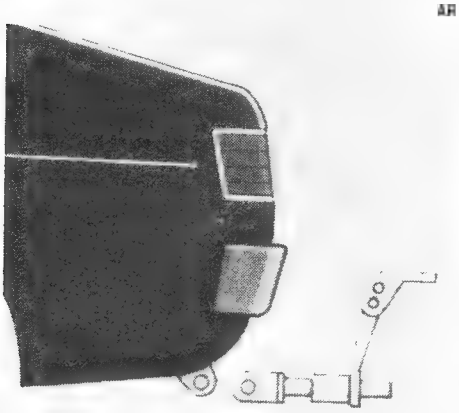
GFS Electronic Imports recently released a new "no holes" mobile antenna mount designed to take the heavy helical and centre loaded whips commonly used in HF operation.

Known as the HS-FB the new mount is designed to take advantage of the towing hook that most modern cars are fitted with today. It bolts directly onto this hook to provide a solid heavy duty mount. Where a towing hook is not available the HS-FB will bolt onto the vehicle's tow bar.

Stainless steel and hot dip galvanising is used throughout the HS-FB's construction guaranteeing a long and useful life. The actual mounting bracket is designed to adjust over an angle of 12 degrees and is drilled to take a ball type antenna base. The ball base is not supplied with the HS-FB.

Cost of the HS-FB is $49 plus $14 p and p. For further details contact the importers: GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132, or Phone (03) 873 3777.

AR



NEW BOOT LIP MOBILE ANTENNA BASE REQUIRES NO HOLES

The new Hoxin HS-25 mobile antenna is designed so that it secures under the boot lip of a vehicle without the need to drill any holes.

Available through the importers, GFS Electronic Imports, this unique mount offers people who wish to install a two way radio in the car, an attractive alternative to the hole-in-the-roof arrangement that is usually used.

The HS-25 can be fitted in a matter of seconds so that it can easily be transferred from car to car. Its design allows it to take any of the Scalar type antenna bases that are commonly used in commercial two-way, CB and amateur radio circles these days

Price of the HS-25 is $11 plus $6 p and p. Further information may be attained from GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone: (03) 873 3777.

AR

MICROCOMM SX-155 POCKET SCANNER

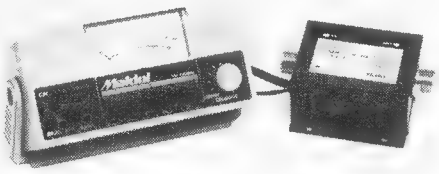
Microcomm recently released their new SX-155 programmable pocket scanning receiver. Manufactured to the same high technical standards as its predecessor, the SX-150, this new scanner offers its potential users a number of advantages.

Enclosed in a sturdy aluminium housing the SX-155 is supplied complete with rechargeable Nicad batteries, battery charger, carrying case and rubber duck antenna. It features an extended battery life of over 4 hours, a better rubber duck for UHF operation as well as lower spurious responses and higher performance. Almost unique amongst scanners, including the larger desk types, is the SX-155's 160 memory channels which are accessed as 4 banks of 40 channels each. Another useful feature is its search and store mode which performs an automatic search and store of active frequencies found while searching between frequency limits. Both its scan and search speeds are set at the rapid rate of 16 channels/second making searches of large portions of a band easy. A priority channel is included as well as user selectable scan and search delays. The antenna uses a low loss BNC Connector.

Other features include an automatic low battery indicator and cut off, a 24 hour digital clock as well as a receive sensitivity of 0.5 uV over its operating range.

Priced at $449 plus $14 P & P, the SX-155 or further information on it may be obtained from GFS Electronic Imports, 17 McKeon Road, (PO Box 97) Mitcham, Vic 3132. Phone (03) 873 3777.

AR



VHF/UHF SWR POWER METER

A new VHF-UHF SWR/ Power meter has recently become available. Known as the HS-370S and manufactured in Japan by Maldol it covers a frequency range of 130 to 450 MHz with extended operation outside this band at reduced accuracy. For convenience of mounting and ease of operation it is designed using two sections, the directional coupler is separated from the main indicator unit.

Power measurement ranges are 0 to 20 watts and 0 to 200 watts while its SWR range indicates 1:1 through to 3:1. Insertion loss of the directional coupler is less than 0.5 dB. For night time operation the meter scale may be illuminated by the connection of a 12 volt power source. The HS-370's directional coupler/indicator cable is 1.6 metres long to allow for wide separation and easy mounting of the two sections. Additionally both are equipped with their own mounting brackets. Size of the indicator is 130 x 62 x 38 mm while the coupler is 70 x 60 x 35 mm.

The HS-370S is priced at $90 plus $6 freight. For further information contact GFS Electronic Imports, 17 McKeon Road, (PO Box 97) Mitcham, Vic 3132. Phone: (03) 873 3777.

AR

HIGH GAIN OMNI DIRECTIONAL ANTENNA FOR 1.2 GHz

GFS Electronic Imports of Mitcham, Vic are marketing a new 1.2 GHz high gain omnidirectional vertical antenna. It is designed for base station operation on the 1296 MHz amateur band where there is now quite a lot of FM activity due to the advent of repeaters.

Known as the GP-1217 it is a 17 section colinear type antenna with an overall height of 1.8 metres. The radiating structure is protected from the weather by an attractive blue fibreglass radome which tapers from 20 mm at its base to 14 mm at the top. The GP-1217's mounting hardware is all stainless steel and chrome plated brass. It is designed to mount on any mast size from 25 mm to 50 mm.

A full operating range of 1260 to 1300 MHz is provided by the GP-1217's flat VSWR and a feed impedance of 50 ohms is presented to its N type connector at the base. Gain is 10.8 dBi.

The current selling price of the GP-1217 is $119 plus $14 freight. For further information contact GFS Electronic Imports, 17 McKeon Road, (PO Box 97) Mitcham, Vic 3132. Phone: (03) 873 3777.

AR

HOW'S DX

Ken McLachlan, VK3AH
Box 39, Mooroolbark, Vic 3138

Well my recent remarks about SWLing didn't bring the storm of protests that I thought it might. The only disagreement with my thinking came from Jim VK2BQS, which he describes as a "Zephyr" not a "storm"

Jim does not agree with the requirements I laid down but we are in agreement with one point, that is, the responsibilities of the amateur to reply to SWL reports and Jim on occasions sends the card direct, if there has been an undue delay enroute through the bureau.

Jim is perturbed and thinks that I am a little hard in expecting the details that were laid down in the February issue of AR, particularly with requiring some of the "dialogue" of the QSO. In my possession there are innumerable cards with "dialogue" excerpts noted, also noting the QTH that is given on air which is different to my postal QTH due to the phonetics involved

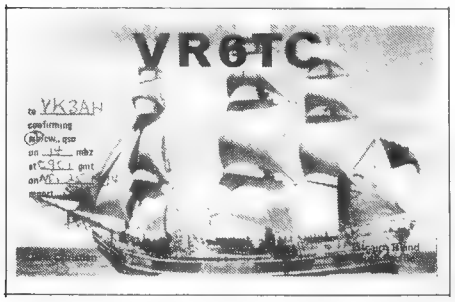
Jim raises a just point but it is felt as do some other amateurs that it has been mentioned to, that the stereo type of SWL is becoming too common. In a contest working at the rate of one or two stations a minute, I have had many cards back listing four or five contacts in order and time On the other hand I have had many cards noted "Hrd u calling CQ" and I have not been on the band at that time or even that day.

Unfortunately it is a problem that is not easy to resolve but I am afraid my line is to expect accurate date time groups and it is felt that some of the dialogue from the station can be copied and noted on the card. Some will term my requirements harsh but I expect more information probably than the average amateur to prove a genuine listening report before a card of my own or on someone's behalf is sent from this QTH and a must is that the log is in my possession before any cards are released

SWLers take heart, Jim's letter has provoked a lot of thought and has mellowed my initial stand somewhat. Thanks for your constructive remarks Jim.

PITCAIRN ISLAND

New call signs appearing from the smallest British colony are VR6YL and VR6AB. The former belongs to Betty, the XYL of well known amateur and island identity Tom Christian VR6TC. Alastair, a radio technician, is the owner of VR6AB and it has been heard frequently on 40 metres.



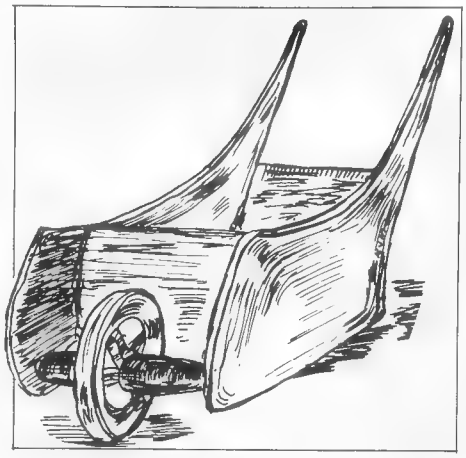
Tom VR6TC's card

Pitcairn is a small rugged volcanic island of about 3.2 km long and 1.6 km wide, with a highest peak of 330 metres named Ship Landing Point, which commands a view of the bay. Pitcairn is located mid-way between Panama and New Zealand and 2500 km ESE of Tahiti. The population has dwindled due to emigration to New Zealand to be around 50 inhabitants that live in the area called Adamstown that is slightly lower than the only small flat area called Flatland.

Public revenue is virtually obtained from the sale of postage stamps that were introduced in 1940 and interest on investments. The small population has approximately 20 children and there are a handful of really elderly people. Every male between the age of 16 and sixty is expected to participate in public work.

Another form of revenue is carving and basket weaving and the arduous journey of 160 km in long boats is necessary to get raw material from Henderson Island for these projects.

Recently the Governor of Pitcairn, Sir Richard Stratton made a visit to the island and presented the inhabitants with a new flag. The new flag approved by Her Majesty Queen Elizabeth II, is blue, with the Union Jack in the top left corner and the Pitcairn Coat of Arms which features a shield with the "Bounty" anchor and the "Bounty" Bible surmounted by the Pitcairn wheelbarrow and bordered by miro leaves and flowers in the colours of yellow, green, pale blue, grey, brown and red, is located in the middle.



An artist's impression of the Pitcairn wheelbarrow

It is believed that this is the only flag in the world to have a Bible portrayed on it and it was raised to the masthead during the singing of the National Anthem at a simple ceremony during Sir Richard's visit Incidentally Sir Richard is also British High Commissioner to New Zealand and Western Samoa and this was his second visit to the island in four years.

SAUDI ARABIA

HZ1AB is temporarily QRT for the next couple of months due to shifting QTH by all reports and Bob Walsh WA8MOE has resigned from all HZ1AB activities that he undertook!

VE DAY ANNIVERSARY

The special call of GV2HQ has been assigned to RSGB Headquarters to commemorate the 40th Anniversary of VE Day on the 8th May. Other stations will be heard in the week 5th to 12th May with the GV prefix

RTTY FROM VATICAN CITY

I5FLN and 18AA hope to have RTTY operational on all bands from HV2VO at the end of June or early July. This will probably be a new country to many that use this mode.

SAINT BRANDON

Another one to look for is Taher 3B8DB, who hopes to actuate 3B7 around late June or early July. This is dependent on his obtaining a linear and suitable antennas and of course the necessary documentation

USSR 160 METRE ALLOCATIONS

The new 160 metre allocations for the USSR appear to be 1.830 to 1.930 MHz on a secondary basis. CW 1.830 to 1.860, CW and SSB 1.860 to 1.900 and all mode 1.900 to 1.930 MHz.

MARION ISLAND

A prediction of the reactivation of ZS2MI turned out to be a "non event" due to the amateur, that was appointed to join the crew for the 14 month stint of isolation, not passing his medical. No operator until next year at least by the looks of things at the moment.

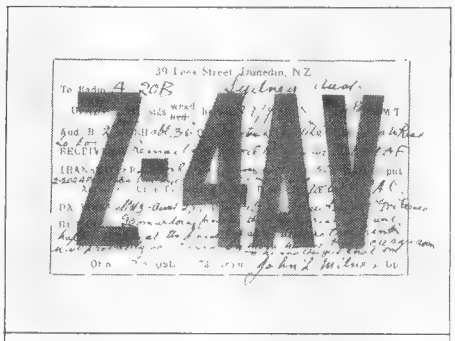
A letter from Wolf Gruellic who was in the 1975/76 32nd Relief Expedition, acting as a Radio/Telex operator, describes it "as a glorious and memorable experience". Any volunteers for next year's team?

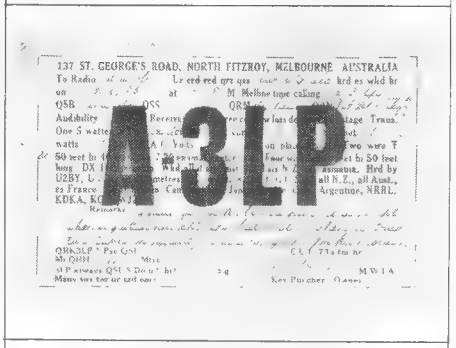
FRANZ JOSEF LAND

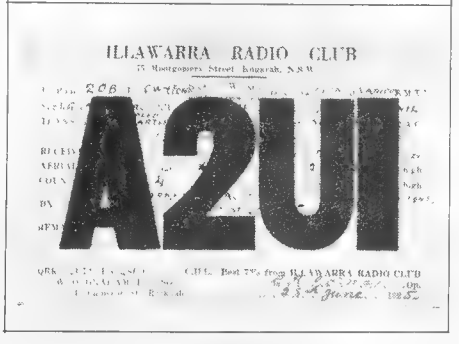
One station QRV from this area is EO1AOK who says he is located on Heiss Island. QSL to UZ1OWA via the Bureau.

CARDS FROM YESTERYEAR

Again are reproduced some cards of yesteryear provided by the courtesy of VK2JM







THIRD PARTY AGREEMENT

An agreement is being considered by the US Department of State and the Federal Communications Committee for a commital of "Third Party traffic" between the Vienna Centre which houses 4U1VIC and US amateurs. If this occurs it would have to be one of the top priority agenda items, of the new DX Advisory Committee chairman Bob K6SSJ, to have it reconsidered for DXCC status. The DXer always lives in hope!!

Of course there are other areas that could be considered after 4U1VIC such as the Pribilof Islands which has died a natural death

BOUVET ISLAND

LA4CG was on the island for about one hour on the 28th February. As expected no amateur operation took place. Better luck next year.

LIBYA

Those that may have worked 5A1TK many moons ago and never received a card. There is hope, David is now G3KXI and recently QSLed a 1962 contact. So if you need 5A and have worked David, delve into the old log books and QSL to David Keeler, 14 Honey Close, Hook End, Brentwood, Essex

SPECIAL CALL YI0AY

The special call YI0AY was allocated to the Arab Scientific Welfare Festival which was held in Baghdad between the middle and end of March with guest operators from A4, HZ, OD and 7X. They had their problems with hostilities prior and during the period.

If you were lucky and really want the card QSL to PO Box 5864, Baghdad and their request is IRCs only. No bureau cards!!

HEARD ISLAND

Heard Island was in the news in March. Lava nad been seen flowing from Big Ben by a passing French Fisheries Research vessel heading to the Antarctica from Kerguelen.

Another news item that circulated on most media releases was that the Anaconda II went aground in her home territory, VK5, but was successfully refloated It can be imagined that the skipper, Captain Grubic, said a few words that couldn't be repeated.

BITS AND PIECES

Andaman and Laccadive Islands activity. Will it be accepted by the ARRL Desk??? ** The PS7ABT/S9 operation will count for ARRL DXCC. A group hope to be QRV on this mode in late June or early July operated by I5FLN and I8AA. ** VK0YL is still work orientated and logs are expected in the mail this month. ** Kimsan XU1SS, has been worked /Mobile. ** Do not waste cards on Mansur EP2KKM who it is believed is a "pirate". ** J4ATC was a special call for a World Air Traffic Controllers Seminar in Athens between the 16th and 22nd of March. ** WA5TKC has the logs for 9F3USA, 9F3USA/P1 and ET3USF. ** ZV9ZZ is located in Brazil. QSL to PY5IW. ** G3EMY ex ZC4RM says that all his operations were within the Sovereign Base Area of Akrotiri. ** VE3KFE/4U is active from the Golan Heights and should be QRV until late August. Anotner station is OE8AJK/YK who is at the same QTH. ** Number of overseas DX sheets note the activity of VK0GC on 160 metres and other bands. ** A22ME and TE are now QRT. ** By the time you are reading this there is a possibility that Kingman Reef may be a deleted country by the rumours floating around. ** A tip is that Italian stations may be able to increase power later this year! ** Reports to hand indicate that the Indian Government is really making efforts to foster the hobby in that country.

WORKED ON THE EAST COAST

14 MHz Band

4X6LL, 5X5BD, 7Q7LW, 9M2FK*, 9M2FZ, A4XKG, A4XKR, AP2IZ, AP2MQ, CP8HD, DJ0EK, DL6RB,, DL7AH/3X, EI2C,*, EO1AOK, EU3A, EW3AP, G3BJB, G3HWQ, G3YSV, G4BXQ, G4SDF, G4ZVM, GJ2LU, GD4XWF, GM4OEZ, I5ICY, IN3AXI, OE8AVK/YK, OH5OJ OH8OS*, ON4KU*, ON7WW, PA6FLD, PZ1CP, RF0FWW, SK7HW, SP7DRV, VK0GC, Y24HL, YI0AY, YO3RD*

INTERESTING QSL CARDS RECEIVED

9Y4AT, CE1CQZ, CT2QN, CY3WCY, EA8BF, GM3AWW, GW3NNF, GW4ZEV, OH0AC, T30CT, YI1BGD

QSL MANAGERS

5I5RY F6FNU, 6Y5MR.VE3KGK, 7P8BE:VE3FXT, 8Q7CK.12CRG, 9X5NH:DL8OA, 9Y4F:VE7DRW, AX3PB.VK6NE, CE0DPD.CE3DPD, CE0EEO:CE3EEO, EL7H:OE2UE, EO3AWK UZ3WWN, EO4AES.UZ4AWE, EU3A.UZ3AZW, EW3AP RW3PW, F5II/FY:F5II, FM5BH.W3HNK, FM7WD W3HNK, HI0B.HI8IH, J87GL.K9QVB, J87J K4UEE, J87VV KB9AW, JA8IEV/JD1 Bureau, JY1.WA3HUP, JY5C, G4WFZ, JY9WR.G4ATS, KC6KK:OE6BVG, KC6MR/KX6.JJ1TCK, OE8AJK/YK:OE8AJK, P42J.W1KDD, PY0FJ.PY2AJK, S8HZR WA2HZR, SU3KY.SU1IM, T30ZK.JJ1TZK, T70A T70C, T70A/WTD.T70C, TL8DC.FE6EWM TZ6FE:DL4BC, VK0CK VK5LP, VK75A.VK3 Bureau, VP2EAG KJ0D, VP5GEX.K0GVB, VR6AB.ZL4DW, YK1AA.DJ9ZB Z21CA/N Z22JS, ZS3E.K8EFS

ADDRESSES

6V1A	PO Box 971, Dakar, Senegal.
8R1J	PO Box 10767, Georgetown, Guyana
9J2LG	PO Box 30441, Lusaka, Zambia
BY4AA	PO Box 205, Shangha , People's Republic of China
BY5RA	PO Box 730, Fuzhou, People's Republic of China
C21DB	PO Box 225, Republic of Nauru, Central Pacific
C21FS	PO Box 83, Republic of Nauru, Central Pacif c
CE0DPD	PO Box 9, STGO10, Santiago 12, Chile
CE0EEO	PO Box 101, Santiago, 12, Chile
CE0ZIJ	PO Box 1, Easter .sland, Chile
CO2GB	Glor a, C/- PO Box 9, Havana 1, Cuba
D68AZ	PO Box 410, Moroni, Comoros
EA9.B	PO Box 213, Melilla
EL2BB	PO Box 463 Monrovia, Liberia
EP2MA	PO Box 34/214, Teneran, Iran
J6LLO	PO Box 800, Castries, St Lucia, W ndward Islands
SV5TS	PO Box 251, 85100 Rhodes
SW2XR	PO Box 33, Kilk s, Greece
T77C	Tony Ceccoli, via Della Carrara, 67, 47031, Republic of San Marino, via Italy
V3ZZ	PO Box 128, Napoleonville, LA 70390, USA
VK9XJ	PO Box 138, Christmas Island, 6798 Australia
YN8RR	PO Box 122, Jinotepe, Nicaragua

CW SWLing with ERIC L30042.

28 MHz

JA2IUG, JE2TOY, JA5WIO

21 MHz

JA, VU2ALI

14 MHz

AH2G, FK8EY, FO8ET, HL1CG, P29JS, P29PL, VK75A, YC0EBS, ZL0A,X, ZS6ME, 9V1VD

10 MHz

PA0RE/CT1, DL7AD, FD6HRV, FE6BVF, FE8VN, W2GDV, W3ARK, N4SU, N0CG, YU2ZZ, ZC4HA

7 MHz

CT2EC, CT3ET, DF9ZP, EA1MV, EA6NB, EM9BWL, EO4AES, FD1JOA, FK8DK, G6CJ, HA8BE, HB9RX, HL2XP, HZ1AB, H44IA, I5FPJ, IS0MH, IT9QGE, KG6GF, KP2J, KV4AM, KC6MR/KX6, LX1PD, LZ1KSD, NP4MO, OE5BCM, ON7FK, P29PR, RA6LRT, T30ZK, UA3GGF, UB5EMX, UC2SLO, UP2NK, UZ0LWX, VK75A YC0BRX, YO4BEW, YU2EZA, YV4AU, Y48ML, ZC4HMS, ZB2EO, ZL7PO, 5Z4MX, 8Q7CK, 8P6AU, 9V1TL, ZK1XU

3.5 MHz

C21NI, KX6DS, P29PR, K5KG/VS6, 8Q7CK

1.8 MHz

VK3BDJ, VK3BML, VK3DQW, VK5PH

QSL CARDS RECEIVED BY ERIC L30042

AL4CAE, HL0SF, 8J3XPO, JD1ABZ, YJ8JH, ZL0AEU, ZS6BZ 10 MHz F9HR, JA5ANP, JA6PJJ, JA7AXP, JA8XR, OK1AJN

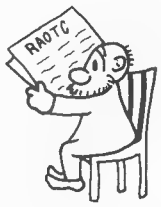
THANKS

Sincere thanks go to the following. The Editors of weekly, bi-weekly and monthly newsletters including the ARRL NEWSLETTER, RSGB DX NEWS, QRZ DX, LONG SKIP, DX FAMILY FOUNDATION NEWSLETTER, WESTLAKES ARC MONTHLY NEWSLETTER, JAN and JAY O'BRIEN'S QSL MANAGER LIST and KH6BZF REPORTS. Magazines including CQ, cqDX, QST, RADCOM, JARL NEWS, KARL NEWS, OZ, 73, BREAK IN and VERON

Members who have contributed include VKs, 2JM, PS, BQS, EBX, 3YL, G3NBC and L30042 Overseas amateurs include G1EOD, I8SAT and ZL1AMM Sincere thanks to one and all

AH

Radio Amateur Old Timers Club



Kevin Duff,
Publicity Officer, RAOTC
10 Stanley Grove, Canterbury, Vic. 3126

The yearly dinner and Annual General Meeting of the Radio Amateurs Old Timers' Club in Victoria was held at the City and Overseas Club on the evening of the 7th of March 1985. There was a good attendance of 56 members including many country amateurs and a number from interstate.

Mac McConnell VK3RV gave a very interesting talk on the first use of electricity for lighting and power in Melbourne including the application of both DC and AC equipment and the advent of the rotary converter, from about 1880 onwards. This was very well received by members.

Max Hull VK3ZS spoke about the production of the OTN Journal and listed some of the events to take place to commemorate the 75th Anniversary of the Wireless Institute of Australia.

Office bearers and Committee for the following year. Murray Clyne VK3HZ, President for the last three years, has tendered his resignation. Nominations for this position were called for and as Max Hull VK3ZS was the only nomination he was duly elected. All other committee members indicated their willingness to serve for the next term and were elected. A vote of thanks was given to Murray for his three years of hard work on behalf of the members. Our long time Secretary-Treasurer, Harry Cliff VK3HC spoke about financial aspects of our Club as did Clem Day VK3GY, the keeper of the membership lists who told us about some of the problems associated with this vital job. John Tutton VK3ZC, in charge of the QSO parties, addressed members about this aspect of our activities. Lay Cranch VK3CF filled us in about successes and problems associated with the monthly first Monday net and also intimated that there is a possibility that people who have held an amateur licence for 50 years or more can take a new call sign. The call could be VM-AAA to VM-AAZ. This has not yet been finalised so listen to the monthly RAOTC broadcast for more news about this. A vote of thanks was given to Lay for all his efforts on benalf of the RAOTC.

Interstate and country members were invited to comment on amateur radio in their areas. These included Bruce Mann VK3BM, from Swan Hill, Frank O'Donnell VK2QC from Ulla Dulla and George Turner VK3GN from Ararat.

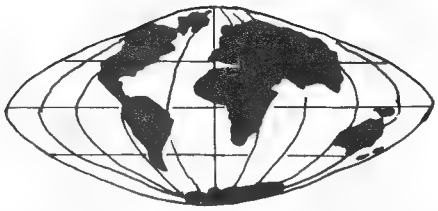
David Wardlaw VK3ADW, Federal President of the WIA addressed the meeting about the activities for the 75th Anniversary of the Wireless Institute. This was very well received and a vote of thanks to David was recorded.

The AGM concluded about 10.15 p.m.

AR

RAOTC members will be saddened to hear of the untimely death of long time member and supporter, Dennis Ayre VK3KP. This occurred during the Annual General Meeting and we offer sincere sympathy to his wife and family.

Mention you saw it in AR when you buy from ADVERTISERS in these papers.



VHF UHF - an expanding world

Eric Jamieson, VK5LP
1 Quinns Road, Forreston, SA 5233

All times are Universal Co-ordinated Time and indicated as UTC.

AMATEUR BANDS BEACONS

Freq	*Call sign*	*Location*
50 005	H44HIR	Honiara
50.008	JA2IGY	Mie
50 020	GB3SIX	Anglesey
50.045	OX3VHF	Greenland
50 050	GB3NHQ	England
50 075	VS6SIX	Hong Kong
50.109	JD1YAA	Japan
50 945	ZS1SIX	South Africa
51.020	ZL1UHF	Mount Climie
52 033	P29BPL	Loloata Island
52.100	ZK2SIX	Niue
52.200	VK8VF	Darwin
52.250	ZL2VHM	Manawatu
52 300	VK6RPH	Perth
52 310	ZL3MHF	Hornby
52 325	VK2RHV	Newcastle
52 350	VK6RTU	Kalgoorlie
52 370	VK7RST	Hobart
52.420	VK2RSY	Sydney
52 425	VK2RGB	Gunnedah
52 440	VK4RTL	Townsville
52 450	VK5VF	Mount Lofty
52.465	VK6RTW	Albany
52 470	VK7RNT	Launceston
52 490	ZL3S.X	Blenheim
52 510	ZL2MHF	Upper Hutt
144 019	VK6RBS	Busselton
144 410	VK1RCC	Canberra
144.420	VK2RSY	Sydney
144 465	VK6RTW	Albany
144.480	VK8VF	Darwin
144.565	VK6RPB	Port Hedland
144.800	VK5VF	Mount Lofty
145.000	VK6RPH	Perth
147 400	VK2RCW	Sydney
432 057	VK6RBS	Busselton
432 160	VK6RPR	Nedlands
432.420	VK2RSY	Sydney
432.425	VK3RMB	Ballarat
432 440	VK4RBB	Brisbane
1296 171	VK6RBS	Busselton
1296 480	VK6RPR	Nedlands

A few comments about the beacons are in order this month: The first listing is shown for the Nedlands (WA) beacon on 1296.480 MHz, and the Kalgoorlie beacon VK6RTU on 52.350 is being overhauled according to the "WA VHF Group Bulletin". The same bulletin also advises that "VK6RPB is currently under test from VK6WV in Port Hedland. Output is about 5 watts into a vertical. It has an unusual ident sequence: VK6RPB in F1 (ie FSK), then VK6RPB — Port Hedland — PO Box No. then VK6RPB Port Hedland in MCW for FM receivers!

The VK0CK beacon has been removed from the list as David the operator will be returning to Australia soon after these notes are being written. At the moment I am not certain of the future of six metres from Macquarie Island, there has been some talk that Denise VK0YL, the first YL operator from the island, will keep six metres activated, but until something definite comes from David I am reluctant to say what is happening. Next month's notes from me should have something definite on the subject.

David VK0CK certainly did what he could to give amateurs within range a VK0 contact. There were more than 200 six metre contacts made during the two summer Es periods that David was on Macquarie Island, and due partly to the huge dog-piles many operators did miss out on a contact. However, it seems somewhat strange that only about a third of those contacting David have bothered to claim a QSL card from me (his QSL Manager and a stamped addressed envelope with your card is all that is required).

It has been quite an experience for me, a die-hard VHF operator, to go on to 20 metres on Sunday afternoons for the past eighteen months to maintain a sked with David VK0CK. Whilst only sporting an FT101B and a long wire antenna (600 feet long and 40 feet high), contact has been made on almost every occasion, twice we failed due to the "radio blackouts" which are common in the cold southern areas, and one other occasion when there was just too much QRM on the band due to an exceptionally good set of conditions and a contest as well!

Now that David is returning before deciding whether to go south again at a later date, we still have Mark VK0AQ (VK5AVQ) at Mawson Base on the Antarctic Continent who is hoping to activate six metres from there. This will certainly provide a test of endurance for the VHF clan, but will more than likely favour VK6 this time, being closer than the eastern seaboard. I am maintaining 20 metre contact with Mark as often as possible, but he has some very difficult problems with interference from the amateur equipment into other equipment on the base, plus return interference to him from the base equipment. Knowing Mark's resourcefulness I am sure he will get everything sorted out before too long and I will be able to advise you of likely operating schedules for the end of the year and six metres.

EME SEQUENCING AND REPORTING

In the world of EME (moonbounce) for many years there have been two main methods of calling and reporting on EME, depending on what band you are operating. At the present it is accepted world wide that on 144 MHz the timing is two minutes receive — two minutes transmit whilst on the higher frequencies of 432, 1296 and 2300 MHz a 2½ minute sequence is used.

Currently there are moves to standardise the sequencing. This is not the first time such a move has been made, but so far universal success has been elusive, with each frequency user thinking the other should change! There is even a suggestion that one minute sequences be used on all bands.

One could argue that with the improvements in technology and better receiving systems that a one minute sequence is all that is needed. This is fine if the signals are well readable, contacts could easily be concluded with one minute sequences. If signals are weak then there are going to be a lot of stations missing out on contacts, the extra time with 2 or 2½ minutes may be all that is required for the identification of a full call sign and/or exchange of signal report. As any DX VHF operator will know, it is not uncommon for signals to change from unreadable to fully readable over a period of one or two minutes during a contact.

A couple of other factors need to be considered as well. The 2½ second propagation delay with the signals travelling to the moon and returning becomes a significant percentage of a one minute sequence. Also, not every antenna system exactly tracks the moon all the time, and there is a need for re-aiming at times! The longer sequence does give some time for this to be done, especially if you are operating on 1296 and above where narrow beamwidths are the order of the day. Some operators on 70 cm rotate their polarisation and it would seem more than one minute would be needed to accomplish this as well as other tasks.

Whilst both sets of bands employ the "TMO5" signal reporting system, some confusion can be caused, particularly to new operators, mainly in the interpretation of the "M" report. "T" is used by both bands to indicate the detection of some signals but with the uncertainty of the exact call sign of the other station. On the other hand, "O" means complete calls are being heard and it is possible to complete a contact, but the level of signals are not sufficient to move up to the next stage which is the usual RST report.

The "M" report on two metres signifies that only one or two letters have been detected and hence it is unlikely a contact can be established both ways. However, on 432 MHz an "M" indicates that enough can be copied to identify a complete call, with difficulty, but still being possible to complete a QSO. Without getting too far out of my depth, one suspects that the "M" system for 432 MHz and above would be nearer the mark than that used on 144 MHz, as surely the "M" on 144 is very close in fact to the interpretation of a "T" report. Those operating EME and using the various systems are the ones who should make up their minds and it is hoped that soon there will be agreement on a suitable system for all bands if only to assist the newcomer. Whatever the reason, I do hope EME operators will give some time and thought to the question, and advise those making the moves of their decision after giving all relevant matters careful consideration.

EME REPORT FROM VK2ALU

From "The Propagator" Lyle VK2ALU reports that EME tests at VK2AMW were carried out on 21/2, 22/2 and 23/2, and consisted of 'fine tuning' the hour angle computer sensing system over the range which was to be used during the programmed 3 hour test period and various other adjustments.

The tests went very well despite the moon not being visible due to heavy cloud cover, echoes were received on the first transmission indicating all systems were working.

Contacts were completed with K2YUH at M/O copy, K4QIF at M/M copy, WB5LUA at M/O copy and VE7BBG at O/O copy. Signal strength at VK2AMW dropped over the last 15 minutes of the 3 hour period and a quick look at the computer readout indicated the dish was 1¼ degrees ahead of the correct position, after resetting the 'tracking' normal echoes returned.

EME REPORT FROM MELBOURNE

Doug VK3UM advises continued success with his 432 MHz EME experiments. On 4/2 at 1030 a sked with VK5MC produced O reports. On 8/2 a random contact with DF3RU was an O report; 24/2: 0935 F1FHI 439/529 random contact; 2/3: 1150 OH2DG random O; 1300 SM5CPD sked O; 1340 DL9KR 539/559 random; 1350 DL9KR SSB 4x4 and 4x4 and exchanged names; 1400 G3SEK sked 439 439; 1416 F1FHN random 439 439.

3/3: 0712 JA9BOH random O; 0735 ZL3AAD random O; 1325 G3LQR random 439 429; 1450 DJ8QL 439 439 but actually peaking 549; 1507 F1FHI random 439 439.

Also on 3/3 2330 to 0000 on 432.1 worked VK1ZIF, VK1BG, VK1BUC, VK1GL, VK1AU and VK2ZAB, with signals varying from 5x3 to 5x6. In addition, Eddie VK1VP can hear VK3UM anytime Doug is on.

SIX METRE STANDINGS

Operators are given advance notice that the next listing is due in the August 1985 issue of "AR". Any changes to your present listing or new listings will need to be on my desk by 15th June for inclusion. Only those people who submit their list in the prescribed manner will be considered! The prescribed manner requires the following information in writing: Your own call sign, date of contact, UTC time of contact, call sign of station worked, country, mode, signal reports sent and received, QSL received yes/no. If contacts were made split frequency 50 to 52 MHz this will help. Please add your signature.

LEARNING TO USE SIX METRES

Although this column is not an advertising medium, there are times when I feel it needs to mention something likely to be of interest to most operators, particularly the newcomers.

The Spring/Summer edition of "6-UP" has two articles which should be required reading for those interested in six metre DX. The first is called "A Tropospheric DX Primer" and the second "Improving Your Chances With Sporadic-E DX" both by Roger Harrison VK2ZTB. Together they give a good insight as

to what you might expect from the six metre band, in particular, and two metres to a lesser extent.

In addition there is an interesting article on a five over five antenna for six metres by Geoff Moss VK2AHK. The improvement over a single antenna due to the lower radiation angle of the stacked pair can be quite dramatic for long distance signals. I recall around 1976 when signals from Japan on six metres were being received fairly constantly I had a wide spaced 6 element on a 7.6 metre boom on six metres which was capable of outstanding performance particularly on Es signals as they started to fade out. However, I could never ever capture the Japanese stations like David VK5KK could, he was always giving 2 to 3 S points better than I with uncanny consistency. Although David and I were 50 km apart I did not think this was always to David's benefit. In the end I built a similar antenna array to David, being an eight over eight with three quarter wavelength spacing at the same height as the original six element beam.

The improvement was instantaneous! For the first time I could now hear Japanese stations at the same strength as VK5KK, and as we used to spend quite a lot of time talking to one another we were able to compare notes. It was found the stacked pair made little difference on Es signals which was as expected although the signals did seem to hang in for a long time at marginal copy as the Es disappeared. As the peak of the sunspot cycle approached in 1979/80 the system was invaluable for those long distance contacts across the Pacific including no less than four contacts to XE1GE in Mexico. It was not so much the slight increase in gain that I was after as the lowered radiation angle and this has proved invaluable even here in the hills where there are no clear take-offs in any direction. The array is very useful for ZL contacts and I think it would be fairly safe to say I can work ZLs longer than most others in the vicinity. Try a stacked pair!

Should you decide to try a stacked pair on six metres may I suggest you pay very careful attention to the mechanical problems of the installation. Do not underestimate the strength of the wind as it is capable of bending most masts at some time or other. I do not use water pipe because it bends so easily, I use the steel tubing from Hills Industries and at least 50 mm (2 inches) in diameter, and inside this I have another smaller piece of the same material which is a snug fit to add to the structural strength and the two are pop riveted together at frequent intervals. The mast extends below the top of the three legged tower for at least 1.5 metres where it fits into the rotator. At the top of the tower is a piece of good quality jarrah 152.4 mm wide and 304.8 mm long and 63 mm thick mounted on a steel plate the same size but 9.5 mm thick which is welded to the tower. The jarrah is bolted to the steel plate and two bands of galvanised sheet metal about 25.4 mm wide are fixed around the steel plate and the jarrah, two either side of the centre and this acts as a safeguard should the jarrah decide to split through being in the weather. An appropriate size hole in the centre of the jarrah and the steel allows the mast to pass through and provides a fairly wide bearing surface and takes the strain off the rotator when the wind puts side strain on the mast. This method of construction should give a long period of service if you do it properly.

RANDOM JOTTINGS

Conferring with Bob VK5ZRO, that watchdog of the bands, it is confirmed that activity on both six and two metres has been rather quiet this month. There has been the occasional opening to VK2 and VK4 but little else.

Bob VK5ZRO reports the almost nightly contacts with VK5ZRG in Whyalla (220 km) on 1296 MHz are still at very good signal strength. By way of a change however, on the 14th March Bob transmitted 70 cm ATV to VK5ZRG for about 3 hours with similar good results.

On OSCAR 10 on 6/3 Bob VK5ZRO was pleased to have a contact with PJ2MI in the Netherlands Antilles off the coast of Venezuela with the usual 5x5 signals. Bob has now lost count of the number of countries and contacts he has had via OSCAR 10.

A brief contact on 20 metres with Mark VK0AQ at Mawson Base indicates Mark has had the Mawson beacon on six metres running but some more work is needed to stabilise the frequency and improve the antenna system. He will advise me when the work has been completed. In the meantime Mark is concentrating on getting his equipment in order so as to be able to work through OSCAR 10 which should give him a better chance to get on the air without the recurring problems of causing QRM to other equipment on the base when he uses 20 metres. During the contact on 17/3 Mark mentioned the temperature was – 10°C and they were enjoying about 12 hours of daylight from about 0830 to 2030 local time.

As there are no letters this month there seems no point just rambling on, so wishing you good contacts as the winter Es period approaches, and closing with the thought for the month: *"If you have tried to do something and failed, you are vastly better off than if you had tried to do nothing and succeeded!"*

73

The Voice in the Hills

AR

INTRUDER WATCH

Bill Martin, VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW 2077

Good news this month from the DOC. A letter received at this QTH from the DOC in Melbourne goes as follows: *"I refer to your letter concerning intrusion into exclusive amateur band allocations by Russian station 'UMS' . . . Action has been taken to bring this matter to the attention of the Russian Administration and to express our concern at operation of 'UMS' within internationally recognised amateur bands. I am pleased to be able to advise that in this regard, the USSR have recently responded indicating that they have initiated steps to eliminate interference on 14.141 and 21.032 MHz from 'UMS'. The Department is therefore hopeful that the situation will be shortly resolved."*

Good news, indeed! However, we still have to see if in fact the USSR **has** taken steps, and, as the old joke goes, "I hope they are big ones." Full marks to the DOC on this one.

As I write the column in March 'UMS' is still operating, but I suppose we have to give them time to make the arrangements to QSY. We will be looking at the frequencies in question very hard for the next few weeks.

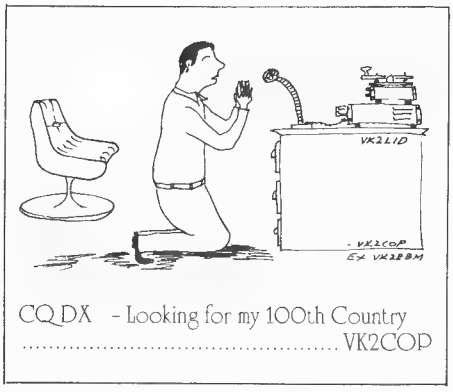
Some of the more dedicated IW observers will be aware of the rubbish to be found on the 40 metre band in the wee small hours. Recently, I had occasion to be in the shack at about 1730 UTC, and found the following on the band. One AM station; four RTTY stations; three jamming stations, and two amateurs (JA and LZ) trying to fit in somewhere, and not doing too well.

Here is a list of intruders which have been heard between 7.010 and 7.020 MHz, which would have probably interfered with the keen CW operators on the band. This is a short list, and there are many more intruders present on the band: HY8J; LNV, YUX3; XB22' RV3, QBSV; HTCY, VCDB; UMS; as well as Radio Beijing (China) The foregoing, with the exception of Radio Beijing, are all on CW, and are probably trying to masquerade as amateurs, hoping to be lost among the legitimate CW signals. They'll have to do better than that!

A big summary for February last, and many thanks to all who contributed. Let me remind once again, of the IW net. This net is held on or about 3.540 MHz on Wednesday evenings, at 1030 UTC (8.30 p.m. AEST) and 1000 UTC (8 p.m. daylight-saving time). In other words, in summer at 8 p.m. and winter at 8.30 p.m. Everybody is welcome to come in with any enquiries.

Well, I need six more countries for the DXCC, so I suppose I had better go and work them, and get the claim away (HI). See you next month, and good DX.

AR



CQ DX - Looking for my 100th Country
..... VK2COP

QSP

HAZARDS OF RF RADIATION

The Standards Association of Australia has recently issued AS2772 — Maximum Exposure Levels for Protection Against Radio Frequency Radiation, which reverses and expands previous guidance material for protection against the biological hazards of non-ionising (RF) radiation, issued in 1972.

Medical research during the intervening years, in many countries, indicates that maximum permissible levels of power density much lower than originally recommended are warranted and this attitude has been reflected in the new standard. For the first time, a maximum exposure level has been introduced for the general public, set at one fifth of the occupational level

Seminars were conducted by the SAA in late March in Sydney and Melbourne covering a wide range of topics including the medical and technical background to the subject, measurement techniques and equipment, reasons for the preparation of the standard and possible further changes envisaged in future editions on the standard. The proposed implementation of the standard in regulations was also discussed. The WIA Federal Standards Co-ordinator, Allan Foxcroft, attended the Melbourne session

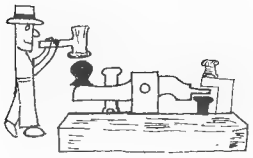
The possible impact of this new standard on amateur operations from both the safety and regulatory viewpoint will be featured in a subsequent issue of Amateur Radio.

Allan Foxcroft VK3AE
FEDERAL STANDARDS CO-ORDINATOR

"An optimist is one who takes the cold water thrown on his ideas, heats it with enthusiasm, generates steam and then forges ahead."

Non-starters are just that . . . NON-STARTERS.

from DX Post — March 1985



POUNDING BRASS

Marshall Emm, VK5FN
GPO Box 389, Adelaide, SA 5001

BITS AND PIECES

This month I'd like to catch up on some of the correspondence. I guess I don't have to tell you about holiday confusion (I'm writing this in early January) so you will perhaps forgive me for the delays in answering letters. In fact, I may have neglected to answer a letter or two, and if you haven't received an answer please accept my apologies. I read and take note of all the mail, using a fair bit of it in the column, and I often worry that a particularly interesting letter will get filed in the wrong place, perhaps even used in the column without ever having been answered.

First cab off the rank this time is Quentin Foster, who describes himself as an "ex brass-pounder, VK6QF". Quentin has written periodically over the last few months as he has helped a friend to learn the code for the exams and get established as a brass-pounder. By the sound of things Quentin is one of the best teachers a novice could have, as a sample of his last letter will illustrate:

"After he got his ticket he was very disappointed that he could not get people to talk to him in Morse. He was despondent, but I encouraged him to keep trying. He found that a lot of novices were much faster and he couldn't think what to send. I gave him a format something along the lines that most amateurs are interested initially in RST, name and QTH and then when you have established good contact both ways the field is wide open for casual chat such as rig, antenna, etc.

"He was always concerned that he couldn't copy letter for letter what the operator sent. I explained to him that this was not always possible due to bad sending, QRM/N, etc and after all you weren't in the commercial business of copying telegrams for customers. You could always send WA or AA for repeats, but why waste time asking for repeats on something that was not important and you probably had a good idea anyway of what it was meant to be.

"My reaction to all his qualms and woes was to throw him in the deep end and tell him to start paddling. This he has done and has now emerged as a fairly competent operator . . ."

Quentin's friend is retired, 75 years old, and has had his novice licence for about six months. Quentin's assistance should be an example to all CW operators and his friend should be an example to all prospective ones.

Another old friend, Norman VK4BHJ wrote with several comments on CW operating procedures. One of his criticisms, which I fully endorse, was about the use of R (meaning received and understood) followed by requests for repeats, or used before the callsigns at the beginning of an over. Another concerned the ridiculous "commencing signal", which is insisted on by the DOC examiners but has no significance in amateur CW operations.

Another comment by Norman was:

"If the 60 day rule still is law how is it we continue to call stations in our bands intruders? An intruder is one who enters without permission. The Intruder Watch has stated that UMS is a USSR naval station and therefore has permission to work in our bands, in fact ANY frequency. I am making efforts to try to start a campaign to get this legislation altered. Our service deserves better treatment."

I'm not familiar with all the legislation, and was personally disappointed to find that there is nothing to prevent Japanese or Taiwanese fishing boats from waffling all over the 80m CW allocation — comments from other readers would be appreciated.

By the way, Norman celebrates his Silver Jubilee on 13th June. His original licence was taken out by his father as he was under age at the time. He has some of the original letters from the PMG, inquiring why he asked for 40 metres and why he wanted to work countries outside the UK and what experiments he intended to conduct! Congratulations, Norman, and keep up the good work.

John VK3CVF has had plenty of experience (RAAF, DCA, Bureau of Meteorology) but feels a bit rusty at times and wishes there were some sort of register of experienced operators competent to give procedure checks. I guess we can all recognize a good op when we hear one, and there is nothing to stop us asking for some constructive criticism. One often hears code that sounds like the operator is a hen pecking at the key, but it's difficult to be critical unless asked, so if you have any doubts about your own sending, ASK (or send me a tape). I have just found out how tough it must have been in "olden times", as my kids refer to anything that happened more than about two years ago. I have been fiddling with a homebrew QRP transmitter, and have built a T/R switch box so I can mute the FT102 receiver while sending. Well, for the first time ever I find myself transmitting with no sidetone, nothing to listen to but the clacking of the key. For all I know it sounded like a hen . . .

Ron VK4BRZ filled me in on the number codes used prior to WWII — 1/A 2/U 3/V 4/4 5/E 6/6 7/B 8/D 9/N 10/T — write them out and you'll see how it works. He also suggested that the expression QTHR is a combination QTH and QTR (What is the correct time?).

Tom VK5TL writes that in the early days of his telegraphy career (1918 et seq) PMG message handling required the use of AR to commence a message. Tom says *"the examiners were very much awake and you would find that some of the messages originated from such points as Ardrossan, Arno Bay, and Arncliffe, to name a few"*.

Last comment is on the use of 73s, which came in for some criticism in another part of the magazine a few months ago. Like so many other aspects of CW operation, it's another case of plagiarisation by phone operators. It used to be standard procedure in many telegraphy operations (and still makes sense in a lot of amateur work) to send numbers twice, especially if they occur in the middle of text. Thus you have 73 73 in most CW QSOs, which became "seventy-threes" on phone.

Thanks again to all my correspondents and keep the letters coming!

73 till next month.

AR

ALARA

Australian Ladies Amateur Radio Association

Margaret Loft, VK3DML
28 Lawrence Street, Castlemaine, Vic 3450

As previously mentioned in this column ALARA is 10 years old in July this year. The State Representatives are presently organising a suitable function in their state to celebrate our Birthday

Bron VK3NTD is arranging a luncheon in Melbourne for the VK3 members, so if you are able to attend please let one of the VK3 members know. Further details as they come to hand.

I wonder if Norma VK3AYL now VK2DJO knew how ALARA would grow in 10 short years, certainly we must thank Norma and her friends for their initiative in setting us on the road we now follow as ALARA members.

NEW MEMBERS

Welcome to new members Valerie VK3CVW; Alma VK3PIP and also welcome back to Josie VK4VAN. We hope you enjoy the friendship that is so much a part of ALARA.

APOLOGY

I must extend an apology to Ian VK2DVJ who won the OM section of our contest last year; unfortunately I put the call sign as VK2DJV or should I blame Murphy. However Ian did get the certificate so all is well.

AGM

This year will be on Monday 26th August. Nominations will be gratefully accepted by Jenny VK5ANW. If you feel you have the time and the ability to offer your services please volunteer. New ideas and new faces are most welcome

After 5½ years as Publicity Officer and 4 years as Contest Manager I feel it is time to step down. The last few months this column has been harder for me to come up with new topics and I am sure out there is a YL who can give a few hours a month, a new approach will be of benefit to ALARA.

I have gone "back to school" and after many years of thinking about it I am going to try and get a couple of TOP subjects, so will still be pecking away at a typewriter but on assignments instead of articles and secretarial duties. As school work permits I will be joining in on the nets when possible, so will still be keeping in touch.

Until next month 33/73/88 to all.

Margaret VK3DML

AR

STOLEN EQUIPMENT REGISTER

In accordance with 1984 convention motion 84:17.01 the Federal Office has established a stolen equipment register. Members wishing to take advantage of this register, either to publicise their loss or to check equipment offered to them may write or telephone to the Federal Office their queries.

To update the list published in the April issue.

MODEL	SER NUMBER	FROM
ICOM IC25A	*03831*	*VK2DPM*
ICOM IC45A	*01876*	*VK2DPM*
ICOM IC211	*6804309*	*VK3BRV*
KYOUTO FM144/10	*5027*	*VK2KUR*
DS EXPLORER 70 cm TRANSCEIVER (HAS EXTENSIVE INTERNAL MODS.)		
ICOM IC215	*05156*	*VK2AMX*
YEASU FT 209RH	*4KO50838*	*VK3CE*
		(BLUE VYNL CASE)
ICOM IC-2A	*04484*	*VK1MX*
YEASU FT207R	*10132725*	*VK2EMC*

AR

KENWOOD

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NOW WITH AM – FM – SSB – FSK – CW
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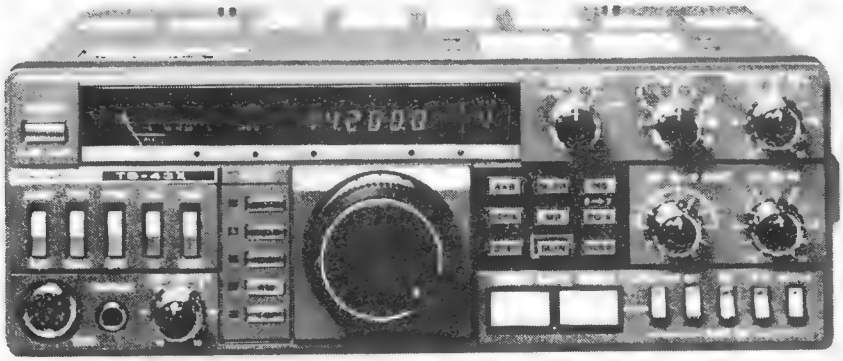

TS-43X HF TRANSCEIVER
The most versatile transceiver of the 80's.

TRIO-KENWOOD (AUSTRALIA) PTY. LTD.
(INCORPORATED IN N.S.W.)
4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066. Ph. (02) 428 1455.

Further beware of dealers not listed in this advertisement who are selling Trio-Kenwood communications equipment. All Kenwood products offered by them are not supplied by Trio-Kenwood (Aust.) Pty. Ltd. and have no guarantee applicable

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REG STOCKMAN COMMUNICATIONS — CNR BANOCKBURN RD. & SHIRLEY ST., INVERELL (067) 22 1303
ELECTRON 2000 — 3 ELIZABETH STREET, TIGHES HILL, NEWCASTLE (049) 69 6399
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LAND LINK — 61 BARNES STREET, TAMWORTH (067) 65 4622
LAND LINK — 108 BEARDY STREET, ARMADALE (067) 72 1665
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BRIAN STARES — 11 MALMSBURY STREET, BALLARAT (053) 39 2808
SUMNER ELECTRONICS — 78 KING STREET, BENDIGO (054) 43 1977
TAS: HOBBY ELECTRONICS — 477 NELSON ROAD, MT. NELSON (002) 23 6751
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ADVANCED ELECTRONICS — 5A THE QUADRANT, LAUNCESTON (003) 31 7075
MARINE & COMMUNICATION — 19 CHARLES STREET, LAUNCESTON (003) 31 2711
V.K. ELECTRONICS — 214 MOUNT STREET, BURNIE (004) 31 7733
QLD: MITCHELL RADIO CO — 59 ALBION ROAD, ALBION (07) 57 6830
S.A. &
N.T.: INTERNATIONAL COMMUNICATIONS SYSTEMS PTY. LTD. — 8 NILE ST., PORT ADELAIDE (08) 47 3688
W.A.: ARENA COMMUNICATIONS SERVICES — 642 ALBANY HWY., EAST VICTORIA PARK (09) 361 5422
TRI-SALES — CNR NEWCASTLE & CHARLES STREETS, PERTH (09) 328 4160
WILLIS ELECTRONICS — 445 MURRAY STREET, PERTH (09) 321 2207
BAY RADIO — 18 BANKSIA STREET, BUNBURY (097) 21 2236
FORD ELECTRONICS — 209 HANCOCK STREET, DOUBLE VIEW (09) 446 4745

AR85

AWARDS

Joe Ackerman, VK4AIX
5 Koomooloo Court, Mermaid Waters, Qld 4218

Bill Hempel VK4LC,
FEDERAL AWARDS MANAGER
Southport Avenue, Eagle Heights Qld 4271.

I have finally caught up on all the backlog of work even though I have had to ask some amateurs to kindly help me by providing a list of their countries on a photocopy of the latest DXCC listing from the 1984 Call Book, listing the countries worked in full and in black biro. You may need a photocopy of your records one day if yours is lost. All the DXCC records are kept in lever back folders by states, so you can appreciate whilst computer type listing, while neat, do not fit into the format of the DXCC records. If you are unable to obtain a photocopy please write me with $1 to cover expenses and the pages will be forwarded to you.

My assistant Joe Ackermann VK4AIX is handling all overseas awards and is supplying AR with the relevant details as it is received from overseas.

The WAVKCA award is still the most popular award, 48 have been mailed out in the last two months. I have received many complimentary replies from overseas amateurs who have received their certificate — it is excellent publicity for the WIA.

A proposition has been submitted to Federal Executive that all DXCC credits by certified by two members of DXCC status, or alternatively send the QSLs to the Federal Awards Manager. In the meantime checkers of DXCC QSLs are asked to read the rules of the DXCC and in particular note rule 1.3 "the QSL must show the location or address of the station at the time of the contact".

A second proposition submitted is that FAM be able to call for any QSL. These propositions have been carried over from comments from previous Federal Awards Managers and after my second term as FAM I endorse this submission, we must uphold the status of our most prestigious award.

I have carried over, from the previous awards manager, a new listing for DXCC for RTTY, this award is not endorsable by addition of phone or CW contacts. Three have already been issued. Are there any more?

If anyone has any queries regarding any of the above please contact me direct not over the air, thank you.

AR

Chasing awards is an interesting, time consuming and at times a very frustrating part of our hobby.

There are awards which commemorate a special event or occasion and which may only require one contact to gain the award. Others need the amateur or SWL to work/hear a Club station and a number of Club members, while some require you to work a number of geographical areas within their country.

A club or an association after a lengthy debate decide that they will sponsor an award. This is the easy part. Now an agreement has to be reached as to what form their award will take. A pictorial one or a design which may be simple or one involving considerable art work.

The rules and requirements also require consideration. Will the applicant need to have QSLs, or will GRC suffice and/or only log extracts be sufficient.

The requirements must provide some degree of difficulty which will result in an achievement in gaining the award.

How much shall the award cost to cover the printing, handling and postage, of course we must have an awards manager.

It is disappointing to receive an award you have strived for and for it to be spoiled by the relevant details to be written in by "a thumb nail dipped in tar". A little effort in filling in the details enhances the award.

From time immemorial man has sought after trophies and the amateur and SWL are no different in this regard.

Most awards require the applicant to have confirmation of the contacts with QSLs and we all know how hard it is at times to obtain those hard to get QSLs, remember a QSL is the final courtesy of a contact, so "pse QSL".

THE KAUAI AMATEUR RADIO CLUB AWARDS

This Club has made available five awards which are available to amateurs world wide. They are:-

A The Worked Kauai Award (WK)
B The Worked Hawaii Award (WH)
C The Worked Hawaiian Islands Award (WHI)
D The Worked All Hawaiian Islands Award (WAHI)
E The Worked All Hawaiian Counties Award (WAHC)

1 All contacts must be dated 1 January 1980 or later and any band and/or mode may be used. Contacts through repeaters are not allowed.

2 GRC rules apply. Submission of QSL cards is not required. The cards must be checked, and the list certified by an officer of any recognised amateur radio society or club.

3 The calls on the certified lists should be in alphabetical order with the times in UTC.

4 Specific award requirements are as follows:-

WK — DX stations need only three contacts with KARC members.
WH — DX stations need only 15 contacts with Hawaiian stations, including one KARC member.
WHI — Contacts with five Hawaiian stations on each of the following islands: Hawaii, Kauai, Maui and Oahu.
WAHI — Contacts with at least one Hawaiian station on each of the following islands: Hawaii, Kahoolawe, Kauai, Lanai, Molokai, Maui, Niihau and Oahu.
WAHC — Contacts with at least one Hawaiian station in each of the following counties: Hawaii, Honolulu, Kalawao, Kauai and Maui.

Applications should state which award is being applied for and if specific band or mode endorsements are desired

The KARC will furnish a current membership list upon request — include SASE or IRCs.

All correspondence should be addressed to Awards Manager, KARC, PO Box 548, Kalaheo, Hawaii 96741 USA.

J2 AWARD — DJIBOUTI

First Class: 8 QSOs with J2 stations on two or more bands. Second Class: 15 QSOs with J2 stations on two or more bands, any mode but must include 5 QSOs on CW

Requirements: Any contacts since 27 July 1977 are valid. List of QSOs certified or copy of log extracts with copy of QSLs

Applications to be forwarded to: Awards Manager, ARAD, BP 1076, Djibouti.

Special note, QSL cards if sent will NOT be returned. Information re this Award supplied by J28DN. Cost 12 IRCs or $US6 00.

BOOKLETS

The following information relates to Awards Information Booklets which are available to award hunters:

The Canadian Amateur Radio Federation issues two attractive awards but there are about 65 awards listed for Canada in a booklet issued by Eric S Walden, RR1, Gowanstown, Ontario, Canada N0G 1Y0, cost $5.00.

The International Directory of Awards — cost $8.00 from Vance LePierre, W5IJU, 2618 McGregor, Fernandina Beach, Florida 32034, USA.

The Amateur Awards Directory of the World from Garry V Hammond, VE3GCO, 5 McLaren Avenue, Listowel, Ontario, Canada N4W 3KI, cost $7.00.

Amateur Radio Awards by The Radio Society of Great Britain available from RSGB, 35 Doughty Street, London WC1N 2AE, UK.

DX Awards Guide by Charles J Ellis, PO Box 1136, Welch Station, Ames, Iowa 50010. He has three different volumes available. Write to him for information and cost.

Worldwide Awards Directory Vol. 1 costs $9.95 and Vol. 2 costs $5.95 or both for $12.75. Write to Larry Kebel KB0ZP, 736-39th Street, West Des Moines, Iowa 50265, USA.

The Directory of Certificates and Awards by The International Amateur Radio Society Inc. Available from Scott R Douglas Jr KB7SB, PO Box 9990, Glendale, Cal. 91206, USA. Cost is $12.95 plus $4.50 for postage and packing.

The WIA 1984/1985 call book lists awards issued by clubs as follows.

VK1 Area — 1	VK2 Area — 9
VK3 Area — 20	VK4 Area — 21
VK5 Area — 5	VK6 Area — 3
VK7 Area — 1	VK8 Area — 5

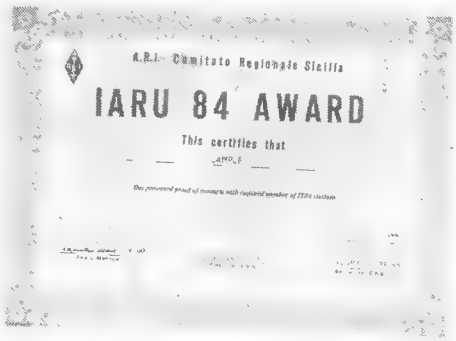
It would be appreciated if awards managers would forward rules and a sample copy of their award for publication in this column.

IARU 84 AWARD RESULTS

The IARU 84 Award was issued by the Regional Committee of Sicily, in order to celebrate the IARU Conference which was held in Cefalu during April 1984.

Over 120,000 QSOs were made by Sicilian amateurs during the month using the special prefix IT84. More than 900 Awards have been sent to 70 countries for amateurs who participated.

Awards were achieved by Australian amateurs, VK4AZA and VK4VC.



WIA 75 AWARD NUMBER 1 CERTIFICATE

A neck injury suffered by Graeme Harris VK3BGH while diving meant he was confined to his home on doctor's orders.

Tuning around the bands he heard WIA members giving out their membership numbers for the WIA 75 Award and decided to give it a go himself.

Graeme said: "This is the first award I have claimed and greatly enjoyed the three days it took during my recent sick leave.

"The WIA is to be congratulated on a well conceived award that must surely promote membership and awareness of our Institute."

He was often heard engaged in friendly but earnest on air rivalry with Kim Wilson VK3CYL, who qualified for the number 2 certificate 24 hours after Graeme, and in a trifecta Gwen Tilson VK3DYL came third.

Graeme VK3BGH is not the only radio amateur or SWL making the award their first "paper chase" because they're getting into the spirit of the WIA 75th Anniversary.

Wireless Institute
of
Australia
THE WORLD'S OLDEST RADIO SOCIETY
75th Anniversary Award

This is to certify — has submitted satisfactory — communicated with the required number of Wireless Institute of Australia members, — 75th

On March 13 1910 nine wireless men came together at the Hotel Australia, Sydney, in a bond of fraternal friendship and common purpose. They decided to unite for the protection and furtherance of their pursuit. The world's oldest radio society the Wireless Institute of Australia was thus founded.

DATE

AWARD RULE CHANGE

It has now been made easier for overseas radio amateurs (and shortwave listeners) including those in VK9 and VK0 to qualify for the WIA 75 Awards.

DX stations and overseas listeners can do this in any one of the following ways:

1) Contact the commemorative station VK75A — that QSO automatically qualifies them for the award.

2) Contact (log) any radio amateur who has obtained the award, and log their WIA 75 Award certificate number.

3) Contact 75 WIA members; no more than 30 in any one call sign area, and log their WIA membership number.

SUMMARY OF THE RULES PUBLISHED IN MARCH AR MAGAZINE:

Radio amateurs and SWLs in Australia need to contact 75 WIA members, a maximum limit of 30 in any one call sign area, and obtain their WIA membership number either off their membership certificate or AR address label.

VICTORIA 150 AWARD

The period for this special award to mark the 150th Anniversary of European settlement in Victoria has been extended until 31 December, 1985.

Originally it was only available for contacts up to the 30th of April, but due to demand it will now run an extra 8 months.

To qualify, radio amateurs (and shortwave listeners) need to work (log) a specified number of VK3 stations between 1 November 1984 until the end of the year.

VK3 stations have to work 150 VK3s, other VKs need 15 VK3 contacts, while DX stations including VK9 and VK0 only have to work one VK3.

For this award repeater contacts are permitted, and claims by SWLs are welcome.

A log extract of qualifying contacts must be submitted with each claim for the award.

A QSL card for a single qualifying contact, endorsed with a congratulatory message on Victoria's 150th Anniversary, plus $2 or equivalent, should be sent to:- *Victoria 150 Award, Wireless Institute of Australia, 412 Brunswick Street, Fitzroy 3065.*

SUPPORT THE ADVERTISERS WHO SUPPORT YOUR MAGAZINE

Victoria 150 Award
This certificate has been awarded to
SAMPLE
in recognition of achieving radio communication with the State of Victoria during its 150th Anniversary.
The recipient of this award is hereby invited to visit Victoria's many tourist attractions.
Jim Linton
President
Wireless Institute of Australia
Ranald Macdonald
Chairman
Victoria's 150th Anniversary Board

HELLO. OLE TIMER

By

D R Sheehan VE2DG

When you lose the thrill of a QSO
With a W-one or two,
When the fact that you're heard in some far distant land
Just don't mean a thing to you.
When sending a card is a burdensome task
And a listeners card is taboo,
It's time you pulled switches and closed up your shack
For there's nothing in this game for you.
When you snub a beginner, when a "chirp" is a crime
And a "QRS" plea you abhor,
You better get out of amateur radio, friend
For there's no fun for you anymore.
I just love to be told, "You're my first, VE2,"
If he only lives over the line;
The pleasure of working a chirpy DC
Is a thrill, boy, to me anytime.
I like to "pipe down", send slow to a kid;
Sure — and tell him his keying is fine,
And when he comes out with that "Pse QSL"
Believe me, the pleasure's all mine.
If you would enjoy this old radio game
Just pause and hark back o'er the years
When if you hooked a "seven", you thought you'd done fine
And to lose him just almost brought tears.
You've got to think back to your lid days again
and remember that this is quite true,
You must do unto others in this Amateur World
As you'd have them do unto you.

— Compliments of W8RHZ
— Spark Gap Times, Jan-Feb 1985

Contributed by Sam Kaufman VK2SK an active radio amateur old timer at the age of 82 years

1984 VK/ZL/OCEANIA DX CONTEST

Jock White ZL2GX
NZART CONTEST AND AWARDS MANAGER

FROM THE CONTEST MANAGER

Many thanks to all who submitted logs — especially to those with comparatively few contacts and to whom the prospect of an "award" was very remote.

Once again I stress that logs need not be rewritten and carbon copies are quite acceptable. Only too well do I know the boredom of rewriting a log. Such a task is second only to that of log checking by a contest manager!

Initial planning for the 1984 contest started in 1982 and stopped following a misunderstanding re administration of the '84 contest — and then got under way again in early 1984.

A number of "VK/ZL/O" contest buffs were circularised re the rules to get some consensus of opinion. To get unanimity one would need the wisdom of a Solomon but the effort is always worthwhile.

Scoring is a problem. I cannot accept a system which permits points made on one band to be multiplied by a multiplier made on other bands. Such a system is illogical and mathematically suspect as the score derived bears little true relationship to the value of the contacts made.

Possibly the fairest scoring method was that used in the "old" BERU.

The problem in 1984 was to achieve a fair distribution of points for contacts on different bands — and, I doubt whether those allocated (even after much discussion with experienced contesters) was as fair as it should have been. Further — the value of contacts on different bands must alter as band conditions change from year to year.

I was castigated by one VK who wanted the simple "all in" multiplier system. There are arguments in its favour . . .
i makes checking the scores easier for the contest manager and for the contestant!
ii permits large scores to be developed by utilising multipliers from one band to boost an "all band" score. BUT — the system used in 1984 gives a fairer comparison of multiband operation — IF the points for contacts on different bands are right.

The matter of an "all band" entry is still one for discussion and debate. Just what IS "all band" — or "open" — or, call it what you may! Is it merely "the highest submitted score" — or "a score made up of operation on more than one band?" — on two? — on three? — on four? — on five? The fat is now well and truly in the fire. A perusal of the tabulated results makes the point. On CW, there were only three "all band" scores (the five accepted HF bands) and three on phone. What sort of "bonus" is warranted? Certainly NOT any form of multiplier! I believe this to be the major point to be resolved. I intend giving special certificates to those who submitted "five band" logs.

It is disappointing that some found difficulty with 80 metre contacts. Rule 9c clearly states "contacts between VK and ZL stations" — NOT VK to VK or ZL to ZL which is clearly indicated in 9d when dealing with 160 metre contacts.

This was done specifically to encourage VK to ZL contacts on 80 metres and attention is drawn to some background information . . .
**** at one time we had a VK/ZL contest for 80 metres only.*
**** many ZLs are not licensed for HF but can operate on 80.*

Results are tabulated for ease of comparison and set out in "scoring areas" as defined in the rules. I feel that this is not merely a desirable way of presentation but an essential way.

Once again every effort has been made to expedite the promulgation of results. As an old "contester" I'm fully aware of the frustration of waiting —waiting!! It was not pleasant to receive a great deal of "flack" (and some letters with more than mere flack) concerning the late 1983 results for which NZART was not responsible.

I repeat — a growing problem is that of stations operating in an area which is different to that normally considered consistent with the prefix used. It may not be generally known for example that in ZL there could be stations with prefixes of 1, 2, 3, and 4 all operating legally within a "stone's throw" of each other.

Copies of the VK/ZL results and these comments are being posted to all VK and ZL certificate winners.

Copies of overseas results will be sent to all overseas award winners and to major societies.

My thanks to many old contest friends who sent personal greetings with logs. Such fellowship is GREAT!

GOOD LUCK to the WIA with the 1985 contest which is part of the 75th Anniversary Celebrations. You will, as always, receive every co-operation from NZART.

RESULTS

VK PHONE

Call	160	80	40	20	15	10	Total
VK1RJ	—	10	75	17195	21190	3960	42430
VK1ZL	—	60	400	1554	4026	329	6060
VK1LF	—	—	—	1440	—	—	1440
VK2WU	—	1620	160380	276375	124188	4715	567279
VK2APK	—	—	208620	—	—	—	208620
VK2BQS	4200	—	—	8736	29120	1760	43816
VK2PS	6000	40	100	24832	10098	720	41790
VK2PXM	—	—	—	—	6640	—	6640
VK2ABC	—	—	—	5580	—	—	5580
VK2AIC							check
VK2KGX							check
VK3DJE	—	—	—	230265	—	—	230265
VK3DNC	2520	40	3600	1880	608	—	59220
VK3CJW	—	—	60	7638	24700	1955	34353
VK3BEE	17820	—	—	—	—	—	17820
VK3AUQ	360	—	315	728	128	—	1531
VK3XE	—	—	5	1376	—	—	1381
VK3DVT	—	—	—	1110	—	—	1110
VK4LT	—	—	—	93312	7040	21840	119192
VK4SF	—	—	—	20	18	12920	12958
VK5MS	—	78650	100980	311250	106020	—	596900
VK5BW	—	120890	—	—	—	—	120890
VK5QX	—	—	5535	51900	—	—	57435
VK5ARO	—	—	—	37530	—	—	37530
VK5ARC	—	—	—	15168	—	—	15168
VK5NOD	—	—	—	—	11466	—	11466
VK5FF	300	—	—	2268	3248	—	5816
VK5AGX	—	—	—	120	—	—	120
VK6IR	—	—	342930	—	—	—	342930
VK6DU	—	—	129430	3108	37128	—	169666
VK6MD	—	—	—	—	34860	—	34860

SWL Section

L40054	450	17500	18865	1044	4182	2415	44456
L30371	1050	250	3000	550	48	—	4898

VK CW

Call	160	80	40	20	15	10	Total
VK2APK	—	—	604435	28899	17892	—	651156
VK2BQQ	—	4250	118800	24416	25438	—	222758
VK2AQF	—	770	118085	2408	8316	—	129579
VK2DID	—	240	77830	1728	6164	—	85962
VK2GW	—	—	—	—	32592	—	32592
VK2PS	3780	5130	—	11297	4928	—	25135
VK2BAT	120	210	13725	2669	240	—	16964
VK3MR	—	—	322140	—	—	—	322140
VK3AMZ	—	—	276040	—	—	—	276040
VK3AUG	270	2470	30160	16500	13356	270	63026
VK3AKK	—	—	55195	—	—	—	55195
VK3DNC	1080	240	245	1785	160	—	20760
VK3MJ	—	—	4410	10434	1012	—	15856
VK4XA	750	4420	171600	24528	27208	4800	233306
VK4SF	—	90	51590	3565	—	—	55245
VK4TT	—	—	—	28203	—	—	28203
VK5AGX	—	—	—	49377	—	—	49377
VK5GZ	—	8400	9620	6386	9292	150	33848
VK5ARC	—	—	—	29140	—	—	29140
VK5QX	—	—	—	1767	—	—	1767
VK6IR	—	—	245000	—	—	—	245000
VK6IT	—	40	89300	1568	720	—	91628
VK6SM	—	—	—	630	7740	660	8030
VK7RY	1800	250	—	825	—	—	2875

ZL CW

Call	160	80	40	20	15	10	Total
ZL1AIH	—	215340	—	—	—	—	215340
ZL1BXW	450	2240	21120	23532	40896	—	88238
ZL1HV	—	910	43200	19482	15410	100	79102
ZL1AMM	—	560	28080	20592	7752	—	56984
ZL1AFU	—	—	60	35894	14238	1650	51842
ZL1BSG	—	450	17680	90	5494	—	23714

ZL1AIZ	2880	43860	114835	6144	7548	2090	177357
ZL2BR	—	120	55250	43216	31140	210	129936
ZL2OM	—	4320	88605	—	—	—	92925
ZL2RY	600	770	6200	528	11564	—	75462
ZL2AGY	—	—	—	65946	—	—	65946
ZL2AH	—	—	49400	—	—	—	49400
ZL3AGI	—	—	—	17670	—	—	17670
ZL40P	—	—	—	1950	—	—	1950
ZL PHONE							
ZL1AXB	—	—	—	419342	—	—	419342
ZL1ANJ	—	6820	173800	16	193980	1275	375891
ZL1ANH	—	—	286080	30672	35250	20	352022
ZL1AAS	5760	6960	44460	35280	62566	30250	185186
ZL1BXW	5670	160	935	2698	65124	—	74587
ZL1AFU	—	—	60	18684	38844	450	58038
ZL1IM	—	200	5410	2058	84	1040	8792
ZL2AH	1650	2800	33480	14873	28512	2346	83651
ZL1AIZ	—	—	41745	—	—	—	41745
ZL2AQU	—	—	—	21922	—	—	21922
ZL3HT	5460	200	1980	400	3220	—	11260
ZL2AKI	450	—	600	4047	2080	—	7177
ZL2BDC							check
ZL3TX	5250	400	—	—	—	—	5650
ZL4PX	3570	—	—		—		3570
ZL4IJ							check
ZL4QS							check
SWL							
ZL1-261	4140	90	210	736	608	—	5784

SPOTLIGHT ON SWLing

Robin Harwood, VK7RH
5 Helen Street, Launceston, Tas 7250

For many years now I have been hearing stations transmitting on Frequency Shift-Keying (FSK) and the only identification being a single letter sent in Morse. They can be heard in the evenings with the single letter being repeated every three seconds. For example, there is a station on 9.043 MHz with the letter "K" with a 1 kHz shift.

I have been wondering about the purposes behind this signal. It certainly was some kind of direction finding and/or propagational indicator. Recently, I came across an article in an American magazine, written by William I Orr, a respected writer on radio-engineering, on these Single-Letter Beacons (1). This has answered some questions but in turn has raised others.

These beacons use FSK with a 1 kHz shift, which is commonly employed by Soviet and East European nations. There are two beacons operational in different locations, although both are within the Arctic Circle. They also broadcast on a number of frequencies simultaneously. The "K" family of beacons have been pinpointed to the Kamchatka Peninsula near Petropavlotsk and is easily heard here in Australia. Some of the frequencies are 4.005, 7.905, 9.043, 10.570, 11.155 and 18.348 MHz.

The "U" family of beacons are heard here but not as frequently. This perhaps is because of the location near Murmansk. Common frequencies are 7.395, 7 568, 9.056, 10.215 and 12.328 MHz.

Monitors have been giving some time to observe closely the operational patterns for these beacons. To the casual listener, they seem innocous enough, yet a very slight frequency shift of 50 Hz was noted. Orr says that he noted a second beacon, identical to the first, come up 50 Hz higher or lower and the two operated in tandem for about 10 seconds before the first one went off the air. He surmises that these beacons can shift frequency in 50 Hz increments over a band 1 kHz wide to provide 20 possible "channels".

This technique of frequency shift hopping could be indicative of a subcarrier with digital information being superimposed on a normal AM signal. This has been employed over some broadcasting stations in America, where subaudible digital signals (around 80 Hz) are superimposed on the carrier wave, using small-angle synchronous modulation. These subaudible digital signals would not be noticed or interfere with the normal output. Whether this technique is being employed over these beacon signals, one would require a very specialised, sophisticated receiving system to identify the operational sequence.

Occasionally these beacons will burst out into FSK Morse. These are mainly five figure cypher groups, similar to Meteo. However, you may wait several days before you will hear these cypher groups.

Naturally speculation has increased over the purpose behind these beacons. The obvious one, that it is some form of radio direction-finding, can be discounted as such techniques of reliability and accuracy at present do exist such as Loran and OMEGA. Orr says it could be the transmission of tracking and acquisition data on satellites to ships at sea. Probably it is for the transmission of encrypted traffic of a sophisticated scientific military nature and is maritime oriented.

As for stations engaged in clandestine and espionage activities, you can hear stations broadcasting a stream of numbers that does not make sense. This has been going for decades now, and has its origins back in the Cold War. It is usually a female announcer reading five figure cypher groups and is in either German, Spanish or Esperanto. Suspected locations are in East Germany and/or Cuba. The stations do not stick to any one operational frequency or fixed schedule. Some commence with a Martial tune or other music bridge They often pop up within exclusive allocations and you will hear them rattle off their numbers.

These stations can usually be found near 11.3 MHz around 0530 UTC. They are on DSB or reduced carrier SSB (J3E). They use a five figure pad and it is very difficult, if not impossible to decode. However, in the December issue of "PopComm" (2), Alice Brannigan has written an interesting article on these 5-digit codes. She claims that you could break these codes and decipher the traffic. I personally have not attempted the system, but I would suspect that the traffic would be computer-generated and fairly well advanced that the casual listener would have extreme difficulty in breaking the codes.

And talking of codes, I note in the latest ARRL Handbook (3), the inclusion of the other language Morse codes being used these days. You will hear the Japanese and Russians frequently within the maritime allocations and rarely hear the Arabic alphabet except within the Middle Eastern region. It is good that we don't have to assimilate these other alphabet codes when many of us had difficulty adjusting to the Continental Code for our AOCP examinations!

As from mid-April, the BBC World Service programme "Waveguide" has been re-timed from Mondays at 0915 UTC to Tuesdays at 1115 UTC. This 10 minute feature is primarily designed to help those having difficulty receiving BBC programmes. They also occasionally have mini-reviews of receivers currently available. As well, the listener is kept up to date with any frequency alterations to the BBC External Service schedule. Incidentally, the last BBC relay station to be linked up by satellite-feed, was connected up in mid-March. This was the Ascension Island Relay in the South Atlantic. This ended the direct off-air relay of BBC transmissions from UK sites.

The 39th Edition of the World Radio TV Handbook has now been published. I recently received my copy through one of the DX Clubs. The directory lists all the radio and television broadcasters at present, operating and details of various technical and administrative bodies connected with broadcasting. It is quite lightweight and has all the usual data including a review by Larry Magne on the Icom R71A, the Grundig Satellite 600 and the Uniden DX 100 receivers. Unfortunately, because of the ever-changing nature of the broadcasting and propagation scenes, it is difficult, if not impossible to keep abreast of all developments. The publication of supplementary newsletters will assist this, but I do find the various DX programmes plus the monthly bulletins of the DX clubs, keeps me in touch with what is happening.

The price of the WRTH 1985 should be around $30.00 and should be available from most technical bookshops by now.

Well, that is all for this month. The best of good listening to you and 73. — Robin VK7RH.

(1) High Frequency Single-Letter Beacons (SLBs) – William Orr W6SAI "Popular Communications" December 1984 pp 28-31
(2) "5-Digit Codes? Maybe Not So Difficult" Alice Brannigan — "Popular Communications" December 1984 pp 32-34
(3) ARRL Handbook 1985 "Morse Code" pp 19-3

AR

QSP

NEW BATTERY

Inventor of the digital watch George Thiess has developed a battery which he says can give an electric powered car a range of about 400kms.

The magnesium and sulphuric acid battery created by Mr Thiess and his partner Jack Hooker is a third lighter than traditional batteries but yields five times as much power.

They estimated the cost of operating an electric car an average of 16,000kms a year would be slightly less than the average for petrol-powered cars at current fuel prices.

Mr Thiess said his electric car; a converted Mercedes 190E, would have a top speed of about 130 kilometres per hour and could accelerate to 97 kilometres an hour in about 15.5 seconds — comparable to typical diesel powered performance.

AR

EVERYBODY — SOMEBODY — ANYBODY — NOBODY

Once upon a time, there were four people named Everybody, Somebody, Anybody and Nobody

There was an important job to be done and Everybody was sure that Somebody would do it.

Anybody could have done it but Nobody did it.

Somebody got angry about that, because it was Everybody's job.

Everybody thought Anybody could do it, but Nobody realised that Everybody didn't do it.

It ended by Everybody blaming Somebody when actually Nobody could accuse Anybody.

(Telecom News, March 1985)

AR

AMSAT AUSTRALIA

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR

INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Checkin: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685 MHz Summer: 7.064 MHz

AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305 MHz

AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGEMENTS
Contributions this month are from Bob VK3ZBB, Graham VK5AGR, Ross WB6GFJ/VK4BZZ and UoSAT Bulletin Number 117, 15th March 1985.

PACSAT MEETING
A meeting was held at the VITA Headquarters in Washington DC during the 9-10 March involving AMSAT, VITA and UoS. The meeting was followed by a visit to the Goddard Space Flight Centre to view and discuss Get Away Special (GAS) interfaces on the Shuttle

Presentations were made to the meeting covering most aspects of the proposed PACSAT mission, particularly concentrating on:

— *spacecraft launch opportunities*
— *spacecraft structural design*
— *spacecraft system design*
— *modulation schemes*
— *GAS interfaces and orbit control and propulsion*
— *attitude control and stabilisation*
— *resources and funding*
— *exploitation of the UO-11 DCE as a PACSAT test-bed*

A launch on the Shuttle using the GAS was assumed, although other launch options will be investigated. It was agreed that work with the UO-11 DCE would be accelerated as this experiment, already in orbit, was capable of demonstrating much of the PACSAT concept and could be most effective in raising support for the new mission and in proving technologies and software prior to PACSAT system definition. It was proposed that, should the appropriate resources/funds be successfully raised, the PACSAT spacecraft would be designed and built as UoS and the Digital Communications Payload by AMSAT/VITA with launch scheduled for 1987. The only restraint on further progress with the PACSAT mission is now the lack of resources and funds.

SPECIAL EVENT
Congratulations to the Wireless Institute of Australia who are celebrating their 75th Anniversary this year — they were 75 years old on 11th March! Thanks to all members for their support of the UoSAT Programme.

MARCE
The Marshall Amateur Radio Club Experiment (MARCE) is scheduled to fly again on STS 51G slated for May 1986. A procedural error by a Shuttle crew member resulted in the original experiment simply not being turned on. The MARCE Package is in a Getaway Special but nothing will be deployed from the can. Instead, several active experiments will be performed and telemetry will be sent via the amateur bands from a battery-powered transmitter during specific windows of the flight

RS SPACECRAFT NEWS
Two RS satellites may be launched from the Soviet Union this year. According to G3IOR who quotes UA3CR, both RS-9 and RS-10 are in Kaluga 200 km SW of Moscow undergoing tests. The frequencies for RS-10 were provided by G3IOR as follows.

Mode A	*145.96 — 146.00 up*
	29.46 — 29.50 down
Beacon	*29.457 or 29.503, 250mW or 1 watt*
Mode K	*21.26 — 21.30 up*
	29.46 — 29.50 down
Robot	*21.140 up 29.457 or 29.503 down*

A third (unnamed mode) transponder may also be included. Its frequencies were specified as follows:

	21.26 — 21.30 up
	145.96 — 146.00 down
Beacon	*145.957*

At present both RS-9 and RS-10 are to be orbited by a single launcher. However, the builders and organisers are thought to be seeking separate launches for each. The desired orbits would be around 2000 km polar circular orbits. UA3CR has built a Mode J transponder for which he is seeking a launch. The current operating schedule for the operational RS's is, according to G3IOR, as follows:

RS-5	Monday and Friday
RS-7	Tuesday and Saturday (Xponder or robot)
RS-8	Thursday and Sunday

DETAILS OF PHASE-3C
The first transponder to be carried aboard Phase 3C will be a Mode B transponder quite similar to AO-10's. With uplink on 70 cm and downlink on 2 metres, it will have about 180 kHz of bandwidth. The frequencies used will be dissimilar to AO-10's to avoid mutual interference. The transponder used could be the actual flight spare which was back-up for the flight unit flown on Phase 3B (AO-10).

The second transponder, if built as planned, is tentatively dubbed Mode JL and would combine uplinks from 2 metres and 24 cm into a downlink on 70 cm. Approximately 50 kHz of the 2 metres band would either overlap or be placed adjacent to the downlink resulting from the 24 cm uplink. Mode J is especially popular in Japan where 2 metre QRM is intense. Mode B, with its 2 metre downlink is not popular in Japan for this reason. Regarding the Mode L portion of the proposed Mode JL transponder, this would have up to 800 kHz of bandwidth and an improved efficiency HELAPS amplifier according to W3GEY.

The third transponder is one proposed by a new group in West Germany and will be a Mode L packet transponder. Details are sketchy but it appears that the packet transponder may use Mode L, require 2400 BPS FSK on the uplink and generate 400 BPS FSK on the downlink.

The fourth transponder proposal is also sketchy but will use 70 cm for an uplink and generate a 13 cm downlink in the vicinity of 2.4 GHz — suitable for a single FM signal approximately 20 kHz wide. The downlink will be at approximately the 2 watt level.

The kick motor to be employed will be identical to that used on Phase 3B. Revisions to the plumbing associated with the MBB 400 Newton motor, however, will be designed to reduce the risk that unexpected low temperatures as experienced with the Phase 3B launch could preclude kick motor refiring. Loss of helium probably due to very cold temperatures is thought to have contributed to the inability to reignite the Perigee kick motor on AO-10.

The Phase 3C bi-propellant system will be similar to the Phase 3B fuel and oxidiser but will improve the specific impulse by 10 somewhat for the anticipated increased total mass of Phase 3C. The Ariane launcher will place P3-C in a geo-synchronous transfer eclipse with zero degrees inclination. AMSAT then has to raise the Perigee from its perilously low point of a few hundred kilometres to a stable orbit and then accomplish a sizeable plane change from zero to approximately 60 degrees.

The antennas will be reworked but the other key sub-systems will be identical to that flown of AO-10 or quite similar — many sub-systems such as the IHU, BCR and SEU are already built (as flight spares for Phase 3C) and need only be verified and integrated.

AO-10 SPRING SCHEDULE
AMSAT has announced a new operating schedule for AO-10 which will go into effect at 0000 UTC on 1 April '85. The new schedule responds to the changes in sun angle now being experienced and also includes provisions for thermal consideration which will become increasingly important. The new schedule mean anomaly points for switchover are:

032 — 119 Mode B
120 — 137 Mode L
138 — 200 Mode B
201 — 031 Off

Tnx to UoSAT for all the above items

OSCAR 10 SCHEDULES
Information to hand indicates that due to the eclipse that will be experienced over the next six months by Oscar 10 there may be revisions to the operating schedule, on a month by month basis. Therefore it is highly recommended that readers listen in to the AMSAT Australia net on Sunday evenings for the most up-to-date schedule.

REQUEST FOR ASSISTANCE
The following request has been received from Ross WB6GFJ/VK4BZZ.

WB6GFJ is requesting help from all those on any of the OSCAR or RS satellites. A collection of 35 mm color slides is being collected to make a programme of those stations on the satellites. This programme will be also reproduced onto VHS and BETA video if enough interest is shown, and the video would be made available through the AMSAT video library.

Here is what stations need to do. Send two or three GOOD, CLEAR, 35 mm color slides. One slide should clearly show most of the person's stations, and if possible include the person operating their equipment. If necessary, send one slide of equipment, and one of the operator at the rig. The last slide should show the OSCAR antennas. If a person has something unique about their station, or may have slides of an OSCAR DXpedition, please include one or two of those also. In other words, please send more than the minimum number of slides requested, if you wish.

Send your slides to: Ross Forbes WB6GFJ, AMSAT Co-ordinator for North Central California, Post Office Box 1, Los Altos, CA 94023.

We would like slides from stations all over the world, and will make video tapes available in PAL and SECAM format if there is interest overseas.

UPS AND DOWNS
From Bob VK3ZBB we have the latest satellite activity. Thanks Bob.

Satellite Returns

During the period twenty-four Objects decayed including the following Satellites -

1983-049A	Cosmos 1465	Jan 23
1984-119A	Cosmos 1611	Jan 11.
1984-120A	Cosmos 1613	Jan 31.
1985-005A	Cosmos 1623	Jan 30
1985-008A	Cosmos 1625	Jan 25.
1985-010A	STS 51-C	Jan 27.

OSCAR-10 APOGEES MAY/JUNE 1985

SATELLITE — I----------BEAM HEADINGS----------I

DATE	DAY #	ORBIT #	APOGEE CO-ORDINATES UTC HHMM:SS	APOGEE CO-ORDINATES LAT DEG	LON DEG	SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ -DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
MAY											
1	121	1415	0334:49	−4	304			271	−1	284	19
2	122	1417	0253:52	−4	295			277	7	290	27
3	123	1419	0212:54	−4	285	274	5	282	15	297	35
4	124	1421	0131:57	−4	276	280	13	288	23	307	43
5	125	1423	0050:59	−4	267	286	21	296	31	318	49
6	126	1425	0010:01	−4	257	292	28	304	38	333	55
	126	1427	2329 04	−4	248	300	36	315	45	352	57
7	127	1429	2248:06	−4	239	310	43	329	50	12	57
8	128	1431	2207:09	−5	229	323	49	345	54	30	54
9	129	1433	2126:11	−5	220	338	54	3	55	45	49
10	130	1435	2045:14	−5	210	357	56	21	53	56	42
11	131	1437	2004:17	−5	201	16	55	37	49	65	34
12	132	1439	1923:19	−5	192	33	52	50	43	73	26
13	133	1441	1842:22	−5	182	46	46	60	36	79	18
14	134	1443	1801:24	−5	173	57	39	68	29	84	10
15	135	1445	1720:27	−5	164	66	32	75	21	90	2
16	136	1447	1639 28	−5	154	73	24	81	13		
17	137	1448	0419:00	−5	330					268	−2
	137	1449	1558:31	−6	145	80	16	87	6		
18	138	1450	0338:02	−6	320					273	6
	138	1451	1517:33	−6	136	85	8	92	−2		
19	139	1452	0257 05	−6	311					278	14
	139	1453	1436:36	−6	126	91	1				
20	140	1454	0216:07	−6	302			271	3	283	22
21	141	1456	0135:10	−6	292	269	0	276	11	290	31
22	142	1458	0055 39	−6	283	274	8	282	18	297	39
23	143	1460	0014 42	−6	274	279	16	288	26	307	46
	143	1462	2333 45	−6	264	285	24	296	34	320	53
24	144	1464	2252:47	−6	255	292	32	305	42	336	58
25	145	1466	2211:48	−7	246	300	40	316	48	357	60
26	146	1468	2130:51	−7	236	311	47	331	54	18	59
27	147	1470	2049:54	−7	227	324	53	349	57	36	55
28	148	1472	2008:56	−7	217	342	57	8	57	50	49
29	149	1474	1927:59	−7	208	2	59	27	55	61	42
30	150	1476	1847:01	−7	199	21	57	42	50	70	34
31	151	1478	1806:04	−7	189	38	53	54	43	76	26
JUNE											
1	152	1480	1725:06	−7	180	52	46	64	36	82	17
2	153	1482	1644:09	−7	171	62	39	72	28	88	9
3	154	1484	1603:12	−8	161	70	32	79	21	93	1
4	155	1486	1522:14	−8	152	77	24	85	13		
5	156	1487	0301:44	−8	327					267	1
	156	1488	1441:15	−8	143	83	16	90	5		
6	157	1489	0220:47	−8	318					272	9
	157	1490	1400:18	−8	133	89	8	95	−3		
7	158	1491	0139:49	−8	309			265	−2	277	17
	158	1492	1319:21	−8	124	94	−0				
8	159	1493	0058 52	−8	299			270	6	283	26
9	160	1495	0017 54	−8	290	268	3	276	14	289	34
	160	1497	2336:57	−8	280	273	11	281	22	297	42
10	161	1499	2256:00	−8	271	279	19	288	30	307	50
11	162	1501	2215:02	−8	262	285	27	296	38	321	57
12	163	1503	2134:05	−9	252	292	35	305	45	340	61
13	164	1505	2053:07	−9	243	301	43	318	52	3	63
14	165	1507	2012 09	−9	234	312	50	334	57	25	60

SATELLITE ACTIVITY FOR PERIOD DECEMBER 31 1984 TO JANUARY 31 1985

LAUNCHES

Unfortunately there has been a significant curtailment in the release of orbital elements and mission details for satellites launches since the commencement of 1985.

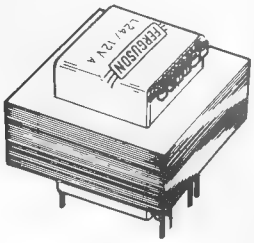
The only information available is given below:-

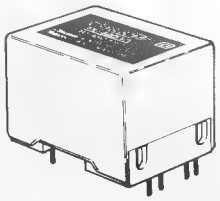
1985-001A	Sakigake		Launched by Japan on 8 Jan An interplanetary probe with heliocentric orbit and the following parameters: inclination 1 448°, perheiion 121.706 million km, aphelion 151 415 million km, period 318.6 days.
1985-002A	Cosmos 1616	USSR	Launched Jan 15.
1985-003A	Cosmos 1617	USSR	Launched Jan 15.
1985-003B	Cosmos 1618	USSR	Launched Jan 15.
1985-003C	Cosmos 1619	USSR	Launched Jan 15
1985-003D	Cosmos 1620	USSR	Launched Jan 15.
1985-003E	Cosmos 1621	USSR	Launched Jan 15.
1985-003F	Cosmos 1622	USSR	Launched Jan 15.
1985-004A	Molniya 3-23	USSR	Launched Jan 16.
1985-005A	Cosmos 1623	USSR	Launched Jan 16.
1985-006A	Cosmos 1624	USSR	Launched Jan 17.
1985-007A	Horizont XI	USSR	Launched Jan 18.
1985-008A	Cosmos 1625	USSR	Launched Jan 23
1985-009A	Cosmos 1626	USSR	Launched Jan 24.
1985-010A	STS 51-C	USA	Launched Jan 24. On board Discovery were astronauts E Payton, E Onizuka, T Mattingly, L Shriver and J Buchli

WANTED ARTICLES Write up your pet project or technical idea so others may share your knowledge through the pages of AR.

PCB TRANSFORMERS

2.5/3VA



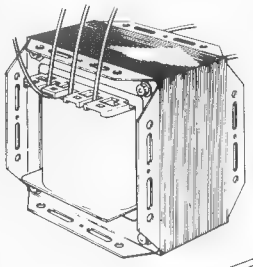


12/15VA

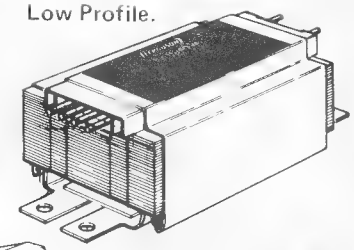
5/7 & 7.5/10VA

- Manufactured to AS3126 and Telecom approved
- Suit standard PCB grids and simplify construction

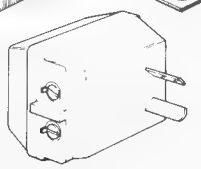
POWER TRANSFORMERS



Low Profile.



Conventional



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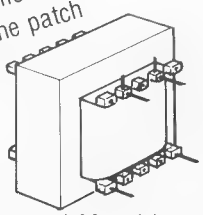
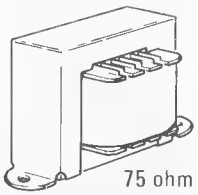
AUDIO TRANSFORMERS

PCB mounted phone patch





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Ask for MAL VK2BMS or DOUG VK2BPX

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FERGUSON

AR85

CONTESTS

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER

P.O. Box 1234, GPO, Adelaide, SA 5001.

CONTEST CALENDAR

MAY	
4- 5	*County Hunters SSB Contest*
4- 5	*G-QRP Club SSB Activity*
4- 5	*Florida QSO Party*
18-19	*ARI International Contest*
25-26	*CQ WW WPX CW Contest (rules April)*
28-29	*CLARA AC/DC "Mystery"*
JUNE	
8-10	*VK/ZL RTTY DX Contest*
15-16	*All Asian Phone (Unconfirmed)*
22	*ARRL Field Day Contest (Unconfirmed)*

Amongst the correspondence received are several letters from operators recently licenced, who state that whilst operation in contests sounds as though it could be an interesting activity they are not too sure how to go about participating in a contest. I will attempt in this column to provide some fairly basic information for both experienced and new contesters.

Contests are run for various reasons, some serious and others not so serious depending on your points of view. An example of a contest run for a specific purpose is the Field Day Contest. Many national societies run such in an endeavour to encourage their members to become skilled in setting up portable stations such as would be needed in an emergency situation. Another type of contest which can be regarded very much as a fun contest is the type of international DX contest where the aim is to try and contact stations in as many different countries as possible or work as many different prefixes as you can Then again there are the 'specialist' contests such as VHF/UHF only, RTTY, SSTV etc. Many contests are also run specifically to cater for sectional interests such as CW only or Phone only

The most popular contests are generally those run by the major international societies such as the American Radio Relay League (ARRL) or well known international magazines such as 'CQ' magazine, although many smaller special interest groups and local clubs in many countries organise contests to suit their varied interests There is hardly a weekend which goes by when there is not some contest being held somewhere in the world

Here in Australia the major contests run by the WIA are the John Moyle Memorial Field Day, the Remembrance Day, the VK Novice and the VK/ZL Oceania contests. Each of these include HF operation with also VHF operation in the Field Day and Remembrance Day Contests.

The Ross Hull Memorial Contest is anotner exclusively Australian contest and is of a specialist nature involving only VHF/UHF bands. Information as to when these contests are held appears regularly in this column as well as the various rules which apply

Most contests include various sections such as Phone, CW and Open. The Open section usually means a mixture of two or more modes being operated by any station. There are sometimes different categories such as single band or multi-band operation as well as single transmitter or simultaneous multi-transmitter operation. For this latter category comes the term 'Multi-multi' which you will hear being used by some of the more knowledgable contesters.

To enter into a contest is in practice a very simple matter. First of all, and MOST IMPORTANTLY, it is necessary to read the rules for the contest in which you intend to operate and ensure that you understand them properly Generally speaking most rules for contests are fairly straightforward and require the application of just a small amount of commonsense However, if in doubt it would pay to ask some experienced contest operator for clarification of any item you don't quite understand. The rules will explain just what is required of entrants for the contest from when it is to be held, what bands may be used, the modes allowed, how the log sheet must be laid out and just what the operators must do to be able to claim a contact in the contest Other items might include details of multipliers to be used for scoring, points to be claimed for particular types of contacts as well as details on where to send your completed log.

So as to prove that a contact has taken place it is usual that stations operating in a contest make an exchange of serial numbers, words or some other cypher and this exchange is recorded in the log of each operator. In this way the contest authorities are enabled to check an individual log against other logs sent in thus authenticating the fact that the claimed contact took place. One quite common form of exchange is known as the RST Serial Number system. With this method the station must send and receive the usual RS(T) report followed by a serial number, usually of three figures, normally commencing with 001 and increasing by 'one' for each successive contact. For example, if the report for the first station worked was Readability 'Five', Strength 'Seven', and Tone 'Nine', you would send the Serial Number 579001. If you were the 'ninth' contact made by the other station and you were RST559 his number to you would be 559009 In some contests this system is not used and instead the exchange might include a number representing your age, ITU Zone or CQ Zone Number or even the input power to your transmitter. The variety of exchanges seems to be limited only by the imaginations of the contest organisers. Again, if in doubt, ask someone else who can explain it all

One fairly obvious way to gain a further understanding of how operation for a particular contest is carried out is to simply listen for a while to some of the other stations taking part in the contest in question. If there happens to be more than one contest running during a particular weekend, which can happen, this approach might be confusing, nowever if you enter into a contest and begin sending the wrong type of serial numbers to another station he will probably let you know that you are making a mistake.

The aim in most amateur radio contests is usually to make as many contacts as possible in a given time. One VERY important matter in operation is you should be not only fast but ACCURATE in all your logging This includes such details as time of contact, station call signs, number exchanges etc. It is also most important that log entries be completely legible.

It is almost inevitable that during the course of a contest the operator or log-keeper will make some mistakes which cause the need for an alteration to the log sheet. Such alterations can mean that a log can become somewhat of a mess in-so-far as its tidiness is concerned. An excellent way to overcome this problem is to spend a little time after the contest tidying the log up To do this all you need is to make a copy of the original, obtain some of the correcting fluid currently freely available for use by such people as typists and use this to 'white-out' the offending sections of the log. Having done this you can use the information from your copy and re-write the corrections neatly. You can then provide a very neat finish to all of this by making yet another copy of the now corrected version as the 'white-out' material on the page will not show up on the sheet which comes out of the copying machine It is certainly worthwhile going to this kind of trouble as under most contest rules untidy or illegible logs can be disqualified and should this happen all your effort of operating in the contest will have been in vain.

Most good contest operators are those who have spent some time observing other good operators at work Make your own assessment of what you consider to be good operating You may consider it to be making contacts as fast as possible. If this is the case your approach may well be wrong. Listen again. *Is that really fast operator going so fast that he slurs his words and phonetics? Does he use correct phonetics? Can you pick out obvious mistakes that he makes as he goes along, particularly when you hear him read back the numbers given to him by another station which you can also hear and you observe that he has those numbers wrong?* If this happens he is obviously not a good example to follow. The good operator works at a steady pace with clear enunciation, not becoming excited, using correct phonetics and being patient when he is asked to 'say again' his call sign or other information needed So try and pick an operator who is setting a good example, listen to him for a while and then do your best to emulate his method. Remain calm and alert to what is going on about the frequency and don't be too afraid of making mistakes. If you are methodical you will find it fairly easy to correct any mistakes you make as you go along. If you know that you have made an error and yet have completed that contact containing the error don't panic Simply place some kind of identifying mark against that contact. The chances are that you will soon hear the station again who should be given the corrected information and in most cases the operator at the other end will be only too glad to receive the correction as without the correction his log also carries an invalid contact which may be disqualified. Should you make the common mistake of duplicating serial numbers simply indicate clearly on your log that such duplication exists. This allows the contest manager checking the logs to sort out any problems which may arise. helps the other operator who otherwise may have contacts deleted from his log by the manager and in most cases the contest manager will appreciate such an indication and will be unlikely to disqualify those contacts with duplicated numbers.

Most contest operation simply needs just a modicum of commonsense. So don't be afraid to give it a try. Start off simply and don't expect to win the very first contest that you enter Might I humbly suggest that you look back over the columns which I have written for this magazine since last September in which I have tried to provide you with hints on contesting, making up of logs and check sheets and generally training yourself to become a good contest operator. No one else can do this for you, it simply needs you to have a proper approach to the problem and the patience to put ideas into practice over a period of time. It is not the purpose of this article to spell out in great detail all the information which could be written about contest operating but simply to encourage you to try your hand at an aspect of our hobby which can become one of great fun and certainly one of real challenge. You can in fact enjoy the fun of virtually competing against yourself as you improve your own capabilities as an operator

Once again might I suggest a few important points which should be kept in mind. Firstly, read the rules thoroughly and ensure that you do understand all that is written, then follow all instructions in the rules **to the letter.** This includes layout of logs, type of contacts, exchanges, timekeeping, making out of summary and declaration sheets, marking of entries with the contest names, endorsements on the outside of the mailing envelope as called for, etc. Also, ensure that your log is mailed with the correct address and postage in plenty of time to reach its destination by the due date for entries.

Give contesting a try. I am sure that you will learn from the experience and you may well enjoy it so much that you will become one of those regular contesters whose call sign eventually becomes one of those immediately recognised worldwide

ROSS HULL MEMORIAL VHF CONTEST 1984

This year the participation in the Ross Hull Contest was most disappointing with a total of only seven competition logs and one check log received The rules had been especially framed to encourage interest and operation, nowever this contest certainly seems to be a dying event. I have suggested in my report to the 1985 Federal Convention that some thought might be given to the disbanding of this contest. It would seem rather

a pity should this happen, however there may be a better way to pay honour to one of the pioneers of radio acknowledged world wide and one who was also an Australian. Despite the poor level of entries the competition was really keen as can be seen by the scores. The winner for 1984 is that very well known experimenter and VHFer Les Jenkins VK3ZBJ. The result however could not have been closer as Les won the contest by only one point ahead of "The Kid From Coolaroo", VK3ZHP. With such a result it seems almost a pity that both could not have won, and that is not intended as taking away any kudos from the winner. It is interesting to note that VK3ZBJ and VK3ZHP both worked all VK call areas with the exception of VK9 whilst VK3ZHP worked ZL1, 2, 3, 4 and 7 and VK3ZBJ ZL1 and 2. Both logs submitted were very neat with the log from Les actually outstanding in this respect. In fact all the logs submitted were of good standard. The win for Les as outright winner is for his operation in the seven day phone section. You will note that there is a tie for first place in the two day phone section with both VK3ZHP and VK3ZYN featuring in the dead heat. In this contest it is obvious that VK3ZHP had put in a magnificent effort and both he and Peter VK3ZYN are to be well congratulated.

VK2QF entered the two day section for 6 and 2 metres only and came out the winner of that section.

Complete details are as follows:-

Call	7 Day Pts	2 Day Pts	Section
VK2QF	-	620	3
VK3YRP	718	320	3
VK3ZBJ	3780	1128	1
VK3ZHP	3779	1314	1
VK3ZYN	3380	1314	1
VK7DC	496	148	1
VK7ZAP	273	99	1

Check Log VK3ZEM

Together with the logs I received some well reasoned letters from VK3YRP, VK3ZYN and VK3ZBJ providing comment on the contest. If you have any comment on the Ross Hull Contest, particularly if you would like to see it continue, please let me know.

DATES OF CONTESTS

By the time you read this the Annual Federal Convention will have come and gone. Behind the scenes there has been a lot going on particularly with regard to contest dates. I had hoped that by now we would have been able to see our Field Day and VK Novice Contests changed to more suitable times in the year. Discussion at the Federal Convention will see this matter sorted out although it is most unfortunate that it now cannot be before 1986 for such to be resolved even though suggestions to make changes were made over a year ago. The VK Novice Contest will thus still have to be held in September right after the Remembrance Day Contest which will undoubtedly mean very few logs entered in the Novice Contest again this year. *Maybe you could prove me wrong on that point eh???*

CERTIFICATES

By now all outstanding certificates should have been received. Catching up on this has meant a great deal of work, in the order of 138 certificates. This is made up as follows:-

Novice '82 — 8. '83 — 7. '84 — 6.
Remembrance Day '83 — 32. '84 — 63.
Field Day '84 — 18.
Ross Hull '84 — 4.

I must admit to being somewhat concerned about the matter of issuing certificates in such cases where there is only perhaps one entry, and a small scoring one at that, in a section of a contest. I have also mentioned this matter in my annual report and thus hope soon that a firm policy will be decided. Incidentally if you believe that you have been entitled to a certificate and have not received one please let me know.

The months of May and June usually seem to be times of lull as far as major contests are concerned. The CQ WW WPX Contest is on for keen CW operators and in this issue are the rules for one of those specialist contests referred to above, namely the VK/ZL 1985 RTTY DX Contest. I would encourage all RTTY operators who can to support this contest which is run by Australian RTTY enthusiasts for your benefit.

I have not received any details of the rules for the All Asian Phone Contest which I anticipate may be held on the weekend of 15 and 16th June. I do note however that according to the WIA 75th Anniversary Calendar the All Asian CW Contest will probably fall on the same weekend as the Remembrance Day Contest in August.

One final comment. As we are now getting well into our late autumn it may be a wise thing to make those last minute maintenance checks on antenna systems which we may have been putting off, as the winter cold and wet can certainly cause problems if joints etc are not solid and waterproof. One well known saying amongst amateur operators from some years back was *'If the antenna system stayed up all winter it wasn't big enough'.*

Rules for the All Asian Contests arrived too late for inclusion in this issue, however they will appear next month. Dates are . . .
PHONE: 15-16 June 1985.
CW: 24-25 August 1985

VK/ZL 1985 RTTY DX CONTEST

TEST PERIOD: Saturday 8th June 1985 0000 UTC to Monday 10th June 1985 0000 UTC.
* Not more than 30 hours of operating is permitted for single operator stations. Non-operating periods can be taken at any time during the contest.
* Multi-operator stations may operate the entire 48 hour contest period.
* Summary of operating times must be submitted with each score.

BANDS: Use all amateur bands 3.5: 7: 14: 21 and 28 MHz.

CLASSIFICATION: (a) Single Operator (one transmitter);
(b) Multi-Operator (one transmitter);
(c) SWL Printer.

MESSAGES: To consist of RST, Time, UTC and Zone.

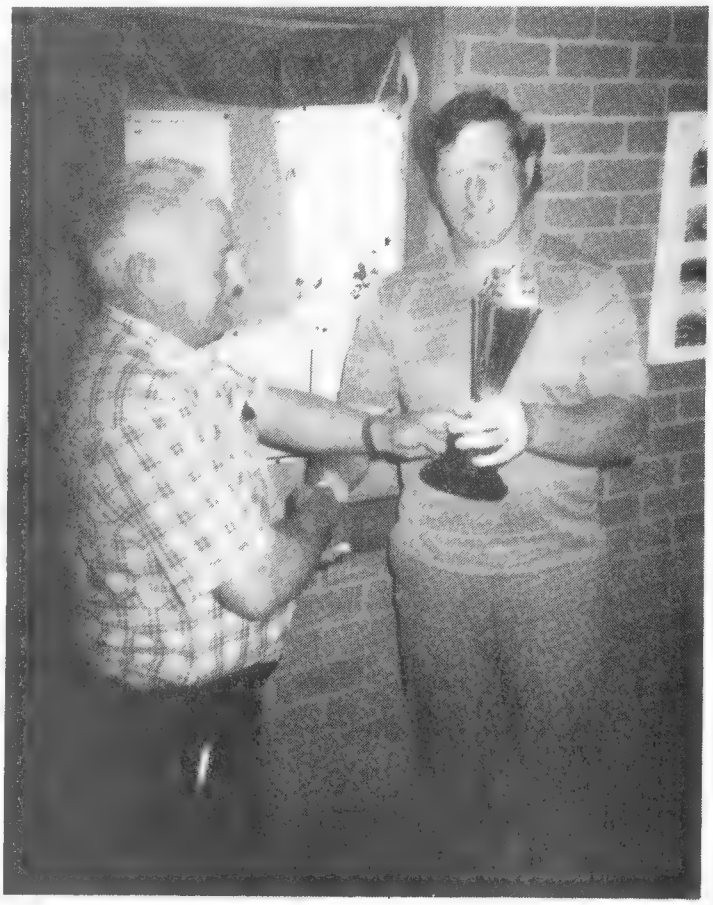
SCORING: As per CARTG Zone Chart, multiplied by the number of countries worked, multiplied by the number of continents worked (maximum six).
After the above calculations, world stations add 100 points for each VK/ZL station worked on 14 MHz, 200 points for each VK/ZL worked on 21 MHz and 300 points for each VK/ZL station worked on 28 MHz.
(Example: 720 points from zone chart x 29 countries worked x 5 continents worked = 104,400 points plus 6VK/ZL stations worked on 14 MHz (that is 600 points) giving a grand total of 105,000 points. A station may be worked only once on each band, but may be worked on another band for further multipliers.

COUNTRIES: Country count as per ARRL list of countries, except that each

EXCHANGE POINTS TABLE

CORRESPONDENT ZONE	YOUR ZONE	
	29	30
1	39	35
2	50	50
3	43	35
4	52	44
5	54	46
6	47	38
7	49	40
8	54	44
9	52	45
10	44	37
11	42	41
12	37	33
13	37	34
14	42	49
15	39	47
16	36	42
17	32	38
18	30	45
19	30	32
20	34	43
21	28	37
22	21	29
23	24	30
24	20	24
25	23	30
26	16	22
27	15	18
28	10	17
29	2	9
30	9	2
31	15	24
32	32	7
33	42	51
34	33	42
35	39	47
36	31	10
37	24	33
38	24	32
39	20	29
40	44	48

Below . . .
The 1984 WIA Contest Champion, Robert Harris VK3XQ proudly receives from Victorian Divisional Secretary, Des Clarke VK3DES, his trophy. He won the championship by scoring the highest aggregate points based on performance in the WIA's four major contests — JMMFD, RD, VK-ZL, and Novice.



VK, ZL, JA, VE, VO, W/K districts count as separate countries Contacts with one's own country count as zero points for multipliers.

LOGS: Logs must show in this order: Date, Time (UTC), Callsign of station worked, Serial number sent, Serial number received, Points claimed.

CLOSING DATE: Logs must be received by the Contest Committee by 1st September 1985 The address for logs is: W J Storer VK2EG, 55 Prince Charles Road, Frenchs Forest, NSW, 2086.

SUMMARY SHEET: Summary sheet must show, call sign of station, name of Operator/s, and address of same, bands used (a separate log is required for each band), the points claimed for each band, number of VK//ZL stations worked, total points claimed and signature/s. Multi-operator station logs must contain the signature and call sign of each operator.

AWARDS Awards will be issued for 1st, 2nd, and 3rd on a world basis and also on a country basis.

The judges decision regarding the placings in the contest will be final and no correspondence will be entered into regarding same. The logs become the property of the Contest Committee on completion of checking.

This contest is now being organised and conducted by the Australian National Amateur Radio Teleprinter Society, PO Box 860, Crows Nest, NSW

AR

See previous page for Exchange Table.

RADIO HUNT TO CELEBRATE LIBERATION DAY, 8 MAY, 1985

By the way of international radio waves, this Radio Hunt aims at establishing contact between amateur radio operators and also licensed Scout groups throughout the world in order to commemorate Liberation Day, 8th May, 1945

Directing and co-ordinating this effort is the **Norwegian Sailors War Veterans International** [Norges Krigsseilerforbund] This association has appointed a committee to oversee the logs, issue diplomas and to make a final report to the Board of The Norwegian Sailors War International [Norges Krigsseilerforbund]

The Radio Hunt starts on Wednesday, 8th May 1985 at 1200 UTC and continues for 24 hours to 9th May 1200 UTC.

The Radio Hunt is open to all radio amateurs throughout the world as well as Scout groups who can obtain eligibility by using a licence-holding radio amateur

Two categories are eligible:
a Individual Station.
b Scout groups holding licences [or groups that have obtained user permission]

Bands/Modes: 20 and 80 m SSB and CW.

The call for the hunt for SSB: **"CQ — Sailing for Peace — Radio hunting Norwegian Sailors War Veterans International"** followed by the amateurs call sign. For CW users the call is: **"CQ Sailing for Peace."** [CQ SPT]

In the QSO give a control number in the normal contest way. The starting number should be 001.

Scores as follows:
a 1 point for a new station on each band and type of emission. Each new country [ARRL list] counts as one multiplier. To get the test diploma you must have at least 15 multipliers.

b QSO with the stations LA9PA, LA3R and LA2C counts as 3 points on every band/mode and the very first contact counts as 3 multipliers.

Separate log sheets must be used for SSB and CW contacts, but the numbering should be continuous.

Illegal operation or bad amateur behaviour will not be tolerated

Logs must be sent to:
Norges Krigsseilerforbund, PO Box 144, 0102 Sentrum, OSLO 1, NORWAY, by post before 15 June, 1985.

Norges Krigsseilerforbund will award participants with 15 multipliers or more with an exceptional diploma.

There will also be special prizes for the stations with the highest score on SSB/CW on each band and the same to the Scout stations.

AR

THE INTERNATIONAL SW RADIOCOMMUNICATION CONTEST "PEACE TO THE WORLD"

Object: To strengthen friendly relations among radio amateurs of the world, increase their sportsmanship and provide the corresponding conditions to fulfil the requirements for the diploma offered by the Radio Sport Federation of the USSR and the E T Krenkel Central Radio Club of the USSR.

Promoter: The Radio Sport Federation of the USSR

Contestants: The contest is open to radio amateurs and listeners from all over the world.

Groups of contestants: A Single operator, single band. B Single operator, all bands. C Multi-operator, all bands, single transmitter. D Listeners.

Contest period: The contest "Peace to the World" is held from 21.00 UTC, Saturday 11 May to 21.00 UTC, Sunday 12 May 1985.

Bands and modes: QSOs may be carried out by CW and Phone with a single sideband modulation on bands 3, 5-7-14-21 and 28 MHz, as well as through radio amateur satellites with retransmission from 144 MHz to that of 28 MHz. QSOs through satellites are judged as those made on separate additional bands with multipliers attributed for them.

No cross mode (phone-CW) is allowed.

Contest call — CQ-M (Peace to all)

During the contest QSOs may be carried out only within the following amateur band allocations:
CW: 3.505-3.600, 7.005-7.040, 14.010-14.100, 21.010-21.150 and 28.010-28.200 MHz.
phone: 3.600-3.650, 7.040-7.100, 14.150-14.350, 21 200-21.450 and 28.400-29.100 MHz.

Check numbers: During QSOs contestants exchange their check numbers composed of RST(or RS) plus QSO numbers (Ex.: 579001 or 57001)

Scoring: a/ Each QSO made within a continent scores 1 point, QSOs between continents scores 3 points. b/ Listeners are judged as follows: one-way QSO receiving scores 1 point; 2-way QSO receiving scores 3 points. c/ Repeated/receiving/contacts with the same radio stations are judged only as those made on different bands irrespective of the mode of operation. d/ A QSO mode within one's home country is judged only to obtain a multiplier with no scores to be awarded.

Multipliers: a/ The number of countries and territories of the world required for a multiplier is determined by the diploma list "R-150-S". b/ For one country/territory/ worked is given one point for a multiplier on each band. c/ Total multiplier is the sum of multipliers obtained on all bands.

Total score: Is the sum of points gained by a contestant on all bands multiplied by a total multiplier.

Winners and awards: a/ Winners are determined separately in each group of contestants: among the contestants of each continent; among all the contestants; among the contestants of each country.

Reporting procedure: The promoter of the contest "Peace to the World" kindly asks you to submit log sheets, irrespective of the number of points obtained, by 1st July 1985 to the following address.
CQ-M Contest Committee, PO Box 88, Moscow, USSR.

AR

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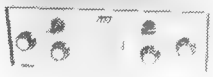
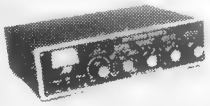
ANTENNA MATCHER WITH ALL

MFJ-949B

Apart from being a versatile antenna matcher it has a co-ax switch, accurate SWR/POWER meter as well as a dummy load.



$408 + $14 P&P



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MFJ-941D uses the same versatile circuitry as the MFJ-949B including co-ax switch.

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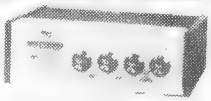
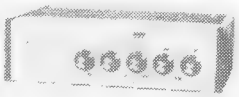


$359 + $14 P&P



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MFJ-BY1 top of the range iambic paddle

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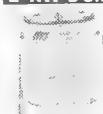

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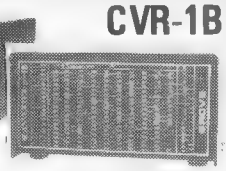
CVR-1B NOW HEAR MILITARY AIRCRAFT

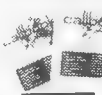


The CVR-1B is designed to allow any scanner which covers the 108-128MHz range to receive the band 215 to 380 MHz. It just plugs into your scanners antenna socket. Now hear the RAAF **$306**

SPECIAL **$266** + $7 P&P

SPECIAL ON PUBLICATIONS

1984 Callbooks



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CLUB CORNER

THE WIA 75TH ANNIVERSARY HAMFEST

Will be held at the Montrose Yacht Club, Hobart on 8th and 9th June 1985. Amateur radio — yesterday, today and tomorrow will be the theme.

There will be a RTTY display, satellite communications, home brew section, QSL card display and more.

DALBY AND DISTRICT ARC

Last October members of the Dalby and District Amateur Radio Club were invited to provide radio communications for the "Chronicle" sponsored Road Runners Marathon held in Toowoomba. We maintained direct contact with all check points and the roving station kept the organisers and public informed on the runners' progress.

As a result of our proficiency at this marathon Radio 4AK requested our assistance in the King of the Mountain race on 23rd March. This race commenced at Withcott which is at the foot of the Toowoomba Range and proceeded up the range into Toowoomba.

5th May will see us portable again. This time in the Kogan district at a Motor Bike Enduro.

Margaret Schwerin VKLAOE
Publicity Officer

GOSFORD SUCCESSES

The Gosford Field Day was another outstanding success this year. As well as the usual line up of regular trade stalls there were the added attractions of a packet radio demonstration and a satellite link for domestic TV. The latter, designed by Vic Barker VK2BTV of Gosford, is being marketed by Dick Smith Electronics. And for those who wanted to get amongst the second hand gear there was a large "disposals" array. Unrealistic prices expected by some of the vendors made the purchase of new gear at slightly higher figures a viable alternative and one stallholder smiled as he claimed that $22 000 had passed across his table during the day.

Most visitors seemed to go away with an armful of something or other, many getting in on the now popular 70cm equipment for amateur satellite work. Despite the claim by some that "there was less people this year", Dick VK2BBK logged out over 900 cups of tea and said that he had run out of milk, biscuits and cups by the day's end. One wag remarked that there was no possibility that the food stall would run out of steak sandwiches. It had something to do with the meat quality they say.

The QSL Bureau did a roaring trade but it was surprising that so many people, including quite well known names in WIA circles still have no idea how the system works.

On the prizes front, Ross VK2ZRQs son took a big share of the pedestrian events but it was good to see another contender put in a good showing. This was Ian Rodenhuis son of Paul VK2AHB who took away some very good looking prizes as well. He managed it all on his own as his dad was busy trying to interest would be travellers in the excellent range of amateur radio tours to Japan.

Tee shirt sellers got right amongst it and cleared almost all the stocks while Beryl VK2DVL did a magnificent job twisting arms to sell a big bundle of raffle tickets. The reptile park was a good refuge for many.

Nev VK2HT had a broad grin at landing the much sought after mobile scramble.

from "Westlakes ARC Monthly Newsletter

Photographs courtesy Greg Jopson VK2VPP

Families were welcomed at the Gosford Field Day in February. From left Dianne VK2DZM, Helen XYL VK2CZZ, Kay XYL VK2VPP, Bob VK2DSM and Mary XYL VK2XI. In the foreground are children of the families.

MAGAZINE REVIEW

Roy Hartkopf, VK3AOH
34 Toolangi Road, Alphington, Vic 3078

(G) General. (C) Constructional. (P) Practical without detailed constructional information. (T) Theoretical. (N) Of particular interest to the Novice.

WORLDRADIO. February 1985. General world amateur news, satellites, contests, historical information, emergency services etc. (G)

CQ. November 1984. Special RTTY issue. (G)

CQ. January 1985. WW WPX Contest. (G) Basic dialects. (C) Handicapped Amateur Overcomes. (G)

CQ. December 1984. Modern RTTY codes and modes. (G) Concluded from November issue.

73 Magazine. February 1985. CB to 6 metre Conversion. (P) Home Brew Cabinets. (PN) Transistor Checker. (N)

73 Magazine. March 1985. Satellite TV Reception. (G)

Over the last two months (possibly due to holidays) inquiries about articles have dropped off. Remember I am always ready to help — particularly country people — with information about articles and also photocopies. If you have any special subject I will be glad to try to find some data on it. A couple of stamps would be appreciated for reply. Don't bother to send an envelope. I can provide suitable size ones for the material.

QSP

ATTENTION NEW WIA MEMBERS

During the Wireless Institute's 75th Anniversary Year 1985 a number of special events are happening.

If you have recently joined Australia's and the world's oldest radio society your attention is drawn to the WIA 75 Award.

This is running until 31 December and all WIA members are asked to participate.

The WIA 75 Award rules appear in AR magazine for March or details can be obtained through your division.

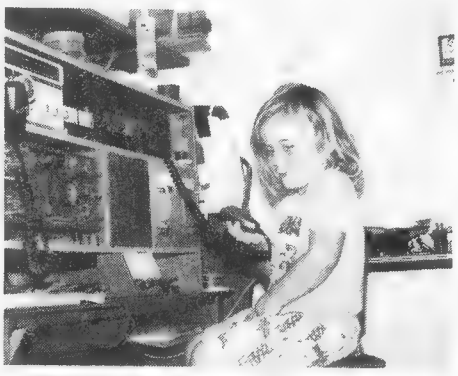
EMPLOYMENT!

The Antarctic division of the Department of Science was having difficulty attracting applicants for highly paid trades and technical jobs in Antarctica.

It has had to readvertise 90 job vacancies with salaries ranging from about $35,000 to $45,000 a year.

The division needs cooks and communications officers to spend between 12 and 15 months in Antarctica, beginning in summer.

Building and allied tradespeople are needed for the same period and for summer only.

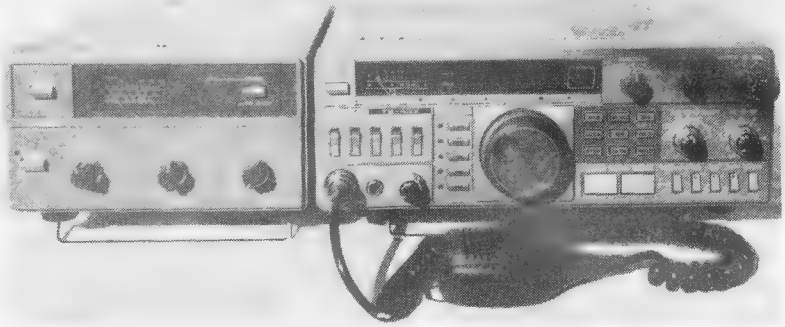


Bronwyn Jopson, aged 4, loves to imitate Dad, Greg VK2VPP. Greg is hoping the interest will remain and Bronwyn will eventually sit for her amateur licence.

PARAMETERS PTY LTD
PERFECTION IN MEASUREMENT

KENWOOD

THE MOST VERSATILE HF TRANSCEIVER OF THE 80'S



TS-43X HF TRANSCEIVER

The TS-430S combines the ultimate in compact styling with its conterparts in advanced circuit design and performance. An all solid-state SSB, CW, and AM transceiver, with FM optional, covering the 160 – 10 meter Amateur bands including the new WARC bands, this remarkable radio also incorporates a 150 kHz – 30 MHz general coverage receiver having an extra wide dynamic range. Key features include dual digital VFO's, eight memory channels, memory scan, programmable band scan, IF shift, notch filter, fluorescent tube digital display, built-in speech processor, all-mode squelch circuit, and a host of orther features designed to enhance its versatility and flexibility of use in Amateur operations.

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The MAY issue of ELECTRONICS TODAY will feature a project by Geoff Nicholls to build a Bell/CCITT 300 baud modem.

ALSO IN THE MAY ISSUE:
Hi-fi review — we cover a number of issues in hi-fi today as well as two reviews.
The strategic defence initiative — will it really work.
One hundred years of time zones.
Budget burglar alarms to build.

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Features: • Unique 6 in 1 control knob
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AZDEN the FM KING PCS-4000

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• 8MHz coverage, 142,000-149,995 MHz in selectable steps of 5 or 10 kHz • Tiny size: Only 2" H x 5.5" W x 6.6" D. Compare! • Microcomputer Control • Up to 8 Non-Standard Splits • 16-Channel Memory in Two 8-Channel Banks • Dual Memory Scan: Scan memory banks either separately or together • Two Ranges of Programmable Band Scanning • Free and Vacant Scan Modes • Discriminator Scan Centring (Azden Exclusive Patent) • Two Priority Memories: Either may be instantly recalled at any time.

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D-70 Morse Tutor	$169
VLF Very Low Frequency Converter	$89
RFA Broad Band Preamp	$89
AD-370 Active Antenna	$199

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CWR-685E transmit/receive RTTY, CW, ASCII, BAUDOT — New Stock . . . $1150.

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240 volt, 50Hz input — 13.8 volts DC, 20 amps cont — 25 amp surge.

ONLY $179

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10 amp cont
15 amp surge.

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YES!! WE NOW STOCK TONO!!

THETA 5000E: Commercial and amateur stand alone communications terminal for CW/RTTY/ASCII/AMTOR, ARQ, FEC, etc. Mode: This new machine is a "DREAM COME TRUE" to any sophisticated amateur.
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PRICE $1200

THETA 9100E: New model with up-to-date microprocessor technology, stand alone terminal, automatic send/receive of MORSE, RTTY, ASCII, ARQ/FEC (AMTOR). Using a light pen graphic patterns can be drawn on the screen and easily sent.

PRICE $999

THETA 777: The most advanced high performance code converter yet. Supports completely automatic send/receive of MORSE, RTTY, ASCII, BIT INVERSION (RTTY) and now ARQ/FEC/SEL-FEC (AMTOR) mode. Build in RS232 and TTL level interface enables operation with most computers or terminals.

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WE NOW STOCK ALL POPULAR DAIWA PRODUCTS

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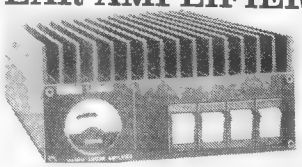
CN-520 SWR/ Power Meter	$89
CN-540 SWR/ Power Meter	$89
CN-410M SWR/ Power Meter	$89
CN-460M SWR/ Power Meter	$89

LINEAR AMPLIFIER



DAIWA amplifiers are designed for use with hand-held or any other transceiver in either mobile or base station configurations.
Because of its light weight and compact size, DAIWA linear amplifiers can be mounted to any place if you want . . .
The DAIWA linear amplifiers are equipped with RF activated stand-by circuitry.
Easy operation. Simply connect your antenna and your hand-held/mobile transceiver to the linear amplifier.
Connect a DAIWA linear amplifier to your suitable power supply and go!

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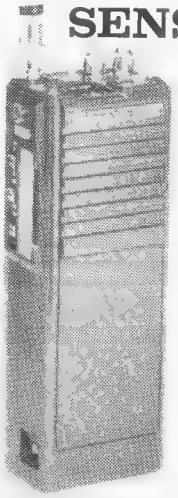
TE-11F3 10/11 metre beam	
HB-34D 4el, 14/21/28MHz beam	
MV-5BH, band trap vert 3.5-28MHz	$179
MV-3BHR, 3 band trap vert, w radials, 14/21/28MHz	$129
HB-443DX, 4 band Yagi	$499
HB-433DX, 3el Quad beam, 7,14,21,28MHz	$399
HB-33SP, 3el Triband 14,21,28MHz	$339
HB-23M, 2el Triband 14,21,28MHz	$269
AX-201NW, 10el, 2 cross Yagi, 144MHz	$299
LP-Q-4 Loop, 7,14,21,28MHz	$129
DL-32S Delta Loop, 14,21,28MHz	$379
ISO-144, 3 dec gain, 0 deg angle of radiation, 2m vert	$89

SENSATIONAL SSB & FM HAND HELD LS-202



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Features:
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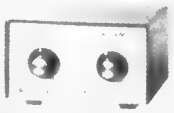
THE DELUXE 2 kW ANTENNA TUNER

• Roller inductor, 3500V Ceramic Cap • 2 kW Balun, Daiwa X Needle Meter • Output Terminals for: Coax, Long Wire, Ball Line. Matches everything from 1.8-30 MHz. Outstanding performance.



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NEW FROM EMTRON
$89
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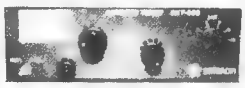
EMB-1 the professionally made noise bridge for all kinds of RF measurements, Antenna work etc.

EAT-300 TUNER $179
+ $9 Post



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VK2 MINI BULLETIN

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
PO Box 1066, Parramatta, NSW 2150

CHANGE OF DATES

Would readers note some changes to those shown in the VK2 notes in March AR. The proposed May Seminar has moved to July (tentatively 20th, Sat.) to make way for the launch by Australia Post of the amateur radio envelope. (See item elsewhere.) Wagga ARC advised that since their city is always heavily booked out on long weekends, they will again be following their established practice and host the South West Zone Field Day on the last weekend of 26-27th October.

OXLEY REGION FIELD DAY

A further reminder that this event is being held on the Saturday and Sunday of the Queen's Birthday weekend at Port Macquarie — the 8th and 9th of June. A full range of field events and contests, including one for your CW skills. Bar-be-que lunch etc. Further programme details via the broadcasts or write to the Oxley Region ARC, PO Box 712, Port Macquarie, NSW, 2444.

ORANGE STATE FOXHUNTING CHAMPIONSHIPS

It was set down for 16th March but on the day only one team showed up. A disappointment for the organisers who went to some trouble to set it up. Maybe a sign of the times but there must be some people still interested in mobile events. Both the council and Orange ARC would like to hear from amateurs re this type of event and whether to try again at a more suitable time.

SEPTEMBER AMATEUR RADIO

VK2 will have a further special in this month. Do you have anything to contribute? If so, please submit it before the 25th June. On the same subject, short technical articles would be most welcome to the editor. Make a few notes and sketches and send them off to the AR editor.

1985/86 CALL BOOK

A reminder to repeater groups and clubs to check and correct any of their current entries. Send corrections to the Divisional office, before the end of this month. Amateurs who have any corrections or alterations should also send the request to the Department of Communications with a copy to the Call Book Editor, C/- PO Box 300, Caulfield South, Vic. 3162. The Call Book is compiled from Department records and is only cross checked against membership addresses, so errors to current listings are only known if the amateur advises. The Department input closes about the end of this month. For non-members there is no means of address cross check.

ANNIVERSARY DINNER

Set down for late June. It will be on a Saturday evening. It will include the presentation of awards held over from the Annual General Meeting in March. Venue details in June AR.

AUSTRALIA POST ENVELOPE

Details still coming to hand as these notes were prepared. On 22nd May Australia Post is to release a prestamped 33 cent envelope which will feature amateur radio and the WIA 75th Anniversary. It will remain on sale for about 6 months. It is hoped to mount displays at many Post Offices and both amateurs and clubs are asked to assist. By now approaches will have been made to you for this assistance through your local club and via the broadcasts. If you can assist please do so and follow the requests as made on the broadcasts. It will be an important promotion for the hobby but to be successful needs everyone's support.

TIME CAPSULE

This started with a launching at VK2WI Dural on the afternoon of Sunday the 10th March 1985. Material will continue to be collected during this year and up to March 1986. Read again the details in March AR. Contribute your QSL card, a photo or letter with details about yourself, interests etc. Post it to 'Time Capsule', C/- PO Box 1066, Parramatta, NSW, 2150. Collection will also be made at the Port Macquarie Field Day and at the Dinner in June, the Seminar in July and Wagga at the end of October. Black and white photos will last better than some color prints. This could also be a good club project. Why not arrange a night and send a bulk posting down. By the way, don't forget to include details about the club or group.

REPEATER NEWS

Notification has been received by the State Repeater Committee for 70 cm systems from Wagga ARC who intend to establish a system within the city area for a local service. Armidale ARC wish to establish a regional service to the north of Armidale to serve them and Glen Innes. Coffs Harbour have indicated their intentions to develop a system for their district. Summerland ARC are investigating the establishment of a two metre system for Byron Bay

NEW DIVISIONAL YEAR

These notes were prepared in mid March. The June notes will contain a report on the AGM, ballot results and office bearers for the forthcoming year. The annual report and other papers were mailed on the 6th March based on the mailing list for March AR. If you missed out on a copy it is perhaps still in the system awaiting delivery. Copies may be obtained from the Divisional office. Since the report was compiled the annual accounts for the Education service and WICEN groups were completed and a summary will be included in a future AR. It was a disappointment on the folding night for the annual report that only a few members showed up to help. Our thanks to those who did attend, but if the interest is not there on future occasions then maybe it will have to be done commercially which will help increase costs and no doubt the subscription rate.

AR

EDUCATION NOTES

Brenda Edmonds, VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic 3199

I am always pleased to receive information about help that is available to the aspiring amateur. Many readers will be unaware of the vast amount of time and patience that go towards helping students get a licence or upgrade to a higher level. Much of this help is unobtrusive, and usually unrewarded except for the satisfaction of knowing that the help is appreciated.

We tend to think that most of the 'Education' is carried out in classes or club discussion sessions, but nearly every week I receive confirmation that there are many amateurs actively participating in the education of a new amateur.

This may be a 'one-off' arrangement for a particular friend — but sometimes it leads the helper into a more structured arrangement for a group next year — and so it goes on.

I have recently been notified about a group who are devoting their energies to improving the CW skills of a group of novices. Operating as the 'Early Bird' net, they are on air every morning except Sundays at 2115 UTC at about 3.545 MHz, to send CW to a group of novices, and give them an opportunity to send in return. Other similar nets are at 0900 UTC for those who want a speed up to 15 WPM — about the same frequency and on 3.595 MHz at 2230 UTC for 11-12 WPM.

There are also some theory discussion groups. One of these runs on about 3 595 MHz at 0500 UTC on Monday, Wednesday and Friday as a self help group to discuss one aspect of the AOCP syllabus at a time.

I have mentioned these nets because in each case the organisers have told me that they would be happy to extend the group a little further. I am sure there are other nets of which I am unaware.

However I still get letters from students who are trying to get through on their own, either because they cannot fit into an existing class programme, or because they are unaware of any assistance that may be available.

So I would be very pleased to collect information about any such systems in existence, so that I can pass it on when necessary. I would also like to have a list of amateurs in various areas who would be prepared to be approached by a student occasionally for discussion or even coaching.

On the other side of helping — I have recently had several more instances of the help that can be given by DOC when the need arises. For the physically handicapped students, special exams have been arranged at a time and place mutually agreed. In other cases, exams have been arranged on request or, for a group in a remote area, by arrangement with the local DI. So, if you are helping someone who has a case for special consideration, make sure that the Department is informed of the situation.

To all those who will be sitting for the May exam, or who are coaching students for it — my good wishes to you all and the usual reminder to candidates to *Read the Questions.*

73
Brenda VK3KT
AR

PRINT HANDICAPPED

The Queensland Tape Service for the Handicapped (Inc) firstly recorded Amateur Radio on tape after a request by a Bundaberg listener.

This organisation is solely concerned with the reading of printed material on to tape, subject to copyright clearances, with distribution through the State Library of Queensland.

Members who know of print handicapped persons who may be interested in this service are advised they should apply to The State Library of Queensland, 132 Grey Street, South Brisbane, Qld. 4101.

Information supplied by Mavis Scott
Honorary Secretary,
Qld Tape Service for the Handicapped
AR

FORWARD BIAS

VK1 DIVISION

Ken Ray
PO Box 710, Woden, ACT 2606

1985 COMMITTEE

At the AGM of the Division on the 25th of February, the following people were elected to the various positions on the Division's committee:

President	*Alan Hawes VK1KAL*
Treasurer	*Kevin Olds VK10K*
Secretary	*Richard Jenkins VK1UE*
Vice-Presidents	*Ken Ray VK1KEN*
	George Brzostowski VK1GB
Committeemen	*Reg Towers VK1MP*
	Phil Rayner VK1PJ
	Ray Roche VK1ZJR
Federal Councillor	*Fred Robertson-Mudie VK1MM*
Alternate	*George Brzostowski VK1GB*

The following were appointed to manage the various duties of the Division.

Broadcasts	*Alan Hawes, George Brzostowski*
Meetings	*Ray Roche*
Awards Manager	*Phil Rayner*
Forward Bias Editor	*Ken Ray*
Education	*Reg Towers, Ken Ray*
Property Officer	*Alan Hawes*
Book Sales	*Eric Piraner VK1EP*
Intruder Watch	*Vacant*
QSL Bureau	*John Clare VK1CJ (Inwards)*
	Ted Pearce VK1AOP (Outwards)
	Fred Robertson-Mudie (Liaison)
Historian	*Ron Henderson VK1RH*
ATV Liaison	*Kevin Olds*
DOC Liaison	*Fred Robertson-Mudie*
Repeaters	*Alan Hawes*
Wicen Liaison	*Ray Roche*
Field Day Organiser	*Phil Rayner*

JOHN MOYLE FIELD DAY

Again, VK1WI was set up on the shores of Lake Burley Griffen However, there were fewer contacts and visitors than in previous years. Two visitors of note were members of the local constabulary wno wanted to know what we were doing camping here — at 2 or 3 a.m.! Still, for all of those who participated, it was a good weekend.

ITU DAY

Don't forget the ITU Day station at Belconnen Mall on Friday 18th May. Listen out for VK1ITU.

AR

VK3 WIA NOTES

VICTORIA 150
GROWING TOGETHER 1984

Jim Linton, VK3PC
DIVISIONAL PRESIDENT
VK3 DIVISION

WELCOME TO NEW MEMBERS

Gerardus Burgers, Charles Cassar VK3VZE, George Goodley, Gilbert Griffith VK3CGG, Frank Hanham VK3BJ, David Haysom, Steven Jenkinson VK3YH, Paul Kehoe VK3KPK, Trevor Kelly VK3ZNX, Raymond Kerwin VK3KRK, Edward McMillan, E C Mitson VK3DXJ.

A E Morse, Elizabeth Pennington, Arthur Piner VK3YFZ, Russell Robbins, B A Rossi VK3XCO, Alexander Schmidt, Colin Schultz VK3COL, Art Usher W9KHN, C W Wilson VK3AWW, Paul Dellas VK3PSD, Rajiv Gandhi VU2RG, Peninsula School Radio Group.

Another year comes to an end this montn with the Vic Div annual general meeting on Wednesday 8 May starting at 8 p.m.

This meeting is a requirement of Corporate Affa'rs so an audited financial statement of profit and loss can be presented to members and to confirm election of councillors

All members were sent an 8 page annual report as an insert in last month's AR magazine.

The AGM is also a major social event with many members making a special effort to attend.

It's an opportunity to find out in detail what your division is doing, and to ask, in person, questions of the office bearers or offer suggestions.

If you're able to make the AGM, I and the other councillors look forward to seeing you.

QSL EUTHANASIA

At least 50,000 unclaimed QSL cards are being held at the Wireless Institute Centre.

These are for QSOs made up to five years ago and keeping them creates a storage problem.

It is unfortunate, but necessary, that the unclaimed cards be destroyed later this month.

Do you have QSLs waiting to be claimed — many limited calls would particularly be surprised to learn they have cards, even DX cards for six metre contacts

CAMPAIGN 3000

Vic Div was congratulated by representatives from other divisions recently on its high and growing level of membership.

Statistics produced at last month's WIA Federal Convention showed your division once again had the largest number of members.

In the 12 months to December 1984, the Victorian Division lead all other divisions both in the number of full members, and associates

Most of the overall growth in WIA membership Australia wide occurred in VK3.

This result followed hard work done by several individual members who have taken up the call to recruit others into WIA membership.

It also reflects the appreciation and satisfaction by radio amateurs and shortwave listeners of the wide range of services available through the division, and the work done to protect and further the cause of hobby radio.

More members are always needed and welcomed so if you know any amateurs who are not a member, what about coaxing them to join.

AR

FIVE-EIGHTH WAVE

Jennifer Warrington, VK5ANW
59 Albert Street, Clarence Gardens, SA 5039

My apologies to those of you who are still listening to the Sunday Morning Broadcasts in an effort to discover when in MARCH the Jubilee 150 launch will take place. When I wrote the column for the March issue, we were still going to have our Jubilee 150 launch in March, however due to a hold-up with the sponsors, QSL cards etc, it was decided to postpone the launch until May, to coincide with the school holidays. At the time of going to press definite dates are not known although it will probably be around the middle of the month. However, there has been one problem, in that we had already agreed to "man" a display station in the GPO from 22nd to 24th May to coincide with the launch of the pre-stamped envelope to commemorate the 75th Anniversary of the WIA — and as if that wasn't enough problems, we have heard rumours that the GPO may be being re-decorated at that time, so all I can say is keep your ears to the ground and we'll try to keep you informed!

One thing that will be certain is that we will have the call sign VK75A for use by South Australian stations from the 13th to the 26th May which will include the proposed days at the GPO.

Many of you will know that when we first took over the Burley Griffin Building it was on a ten year lease, but unfortunately, when the lease expired Thebarton Corporation seemed to be unwilling to give us a long term lease, perhaps because they feared some loss of revenue However, a further request for a long term lease, this year bore fruit (we have asked every time it was due for renewal) and we once again have a ten year lease on the building So now we can start thinking about painting and other improvements which we were unwilling to even discuss on a short term lease.

DIARY DATES

28th May	*(unconfirmed at time of going to press, but hoped to have Ted Dobrinsky who was unable to give us his talk on Map Reading and Navigation, due to illness, in February.)*
25th June	*(also unconfirmed, may be substituted for or with the above) "Forum on Computers" a panel of experts will answer your questions (we would like the questions submitted before-hand — a week or more — so that the experts can do their "homework"!)*

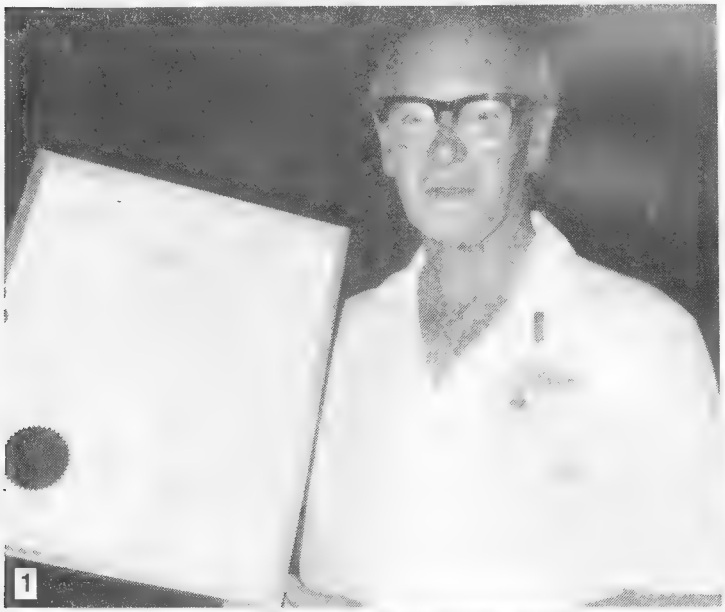
AR

APRIL'S BEST PHOTOGRAPH

The judges at Agfa-Gevaert selected the collection of photographs taken by Sam Voron VK2BVS on page 13 of April's magazine. Sam will now be eligible for the prize in June.

VK4 WIA NOTES

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001.



1 At the 1984 Gold Coast Hamfest, Bill VK4YN, proudly displays the award of the Queen Elizabeth Silver Jubilee Trust for Young Australians. The Award included a substantial cash donation to the Gold Coast Amateur Radio Society for educational purposes. 2 Dave Dawson from the Brisbane office of the Department of Communications was ready to answer questions and was kept very busy. 3 Manning one of the many trade stands were Yoshi VK3BZX (Icom Australia), Lance and Brian VK4AHD. 4 The ladies turned out in full force. All full calls — Sandra VK4ACJ, Lesley VK4ZN, Daphne VK4NE, Lynnette VK4CBH and baby Timothy. 5 Greg Rankin VK4AXT was there to guide those visitors not familiar with the Gold Coast, to the venue.

Photographs by Bud Pounsett VK4QY

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

TRACKING WITH A BEE!

I have a computer programme for the Microbee which tracks Oscar 10 and a few other satellites. As the programme is very long I think it would take up magazine space, so I will gladly make tape copies for anyone (amateur) who will send me a blank tape and return postage.

The programme was developed from programmes written by John Branagan and published by AMSAT UK.

I'll include instructions on how to tailor the programme for any QTH knowing the Latitude, Longtitude and Height

The following is a sample print out.

Thank you,

```
                DATE  14.  3.  85.

 UTC        AZ          EL          RANGE KM.
 ========   =========   =========   =========
 0          343         40          25789.
 15         340         46          25691.
 30         337         5           25593.
 45         334         50          26042.
 100        330         51          26476.
 115        327         51          26954.
 130        324         51          26824.
 145        320         51          26713.
 200        317         51          26620.
 215        314         51          26543.

Stop at 02330
>net save"satellite"
```

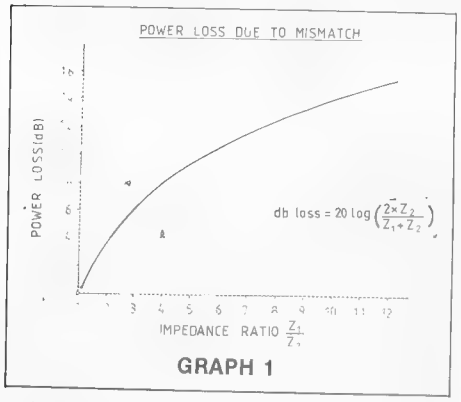
Bevan Hay,
MS 346,
Nanango, Qld. 4315.

AR

TECHNICAL CORRESPONDENCE

I recently needed to find the loss figure, in dB, due to a mismatch at a joint between a50 and a75 ohm coaxial cable

After some searching I eventually ferreted out a formula which enabled me to calculate that loss. It then occurred to me that other amateurs could perhaps be interested in the problem. I calculated the mismatch losses over a wide range of impedance ratios and then drew up a simple graph, as shown below



GRAPH 1

It can be seen that, for example, a 75/50 impedance ratio causes a 1.94dB loss, whereas a 300/50 ohm mismatch causes a loss of 10.8dB

The calculation may not necessarily be of interest, but is shown for information

Terms used:
- V1 Input Voltage
- V2 Output Voltage. This is that part of the signal that passes through the join, ie: usable power.
- Vr Reflected Voltage.
- Z1 Higher Impedance.
- Z2 Lower Impedance

From above and knowing that what doesn't pass through is reflected:-

$V2 = V1 - Vr$ and dividing by V1 gives

$$\frac{V2}{V1} = 1 - \frac{Vr}{V1}$$

The formula for equating reflected voltage with impedance is:-

$$\frac{Vr}{V1} = \frac{Z1 - Z2}{Z1 + Z2}$$

substituting this into the previous equation, along with some rearrangement gives:-

$$\frac{V2}{V1} = \frac{2\,Z2}{Z1 + Z2}$$

and as deciBell loss is twenty times the log of the voltage ratio, this gives:-

$$\text{dB (loss)} = 20 \log \frac{2\,Z2}{Z1 + Z2}$$ which is the formula

used with the graphs. As Z2 was specified as the lower of the two impedances, the result will be negative; indicating a loss.

Calculated values:

Impedance ratio 1.5/1 2.5/1 4/1 6/1 8/1 12/1

dB loss 1.94 4.87 7.96 10.88 13.06 16.26

Yours sincerely,

George Cranby VK3GI
Box 22,
Woodend, Vic. 3442

AR

CLANDESTINE NAVIGATION

After submitting this article to AR, see page 19 Feb, I realised that in the final transcript, one paragraph from the original rough transcript (and how rough!!) had been omitted inadvertently.

By the time I realised, the magazine was already in the pipeline so I decided to take no action and await the results, if any.

Sure enough, among the various responses to the article, were one each from VK7, VK2 and a VK3 SWL all with the query "Why didn't you magnetise the compass needles across the headphone magnets?"

Hence, here is an abridged reproduction of the missing para

Some months prior to "operation compass" an unanticipated night entry by German guards into our prison barracks had nearly resulted in them discovering the radio, refer February AR 1984. I therefore had resolved not to simultaneously expose the 'phones and compass components for risk of discovery, which would result in confiscation of both, including the radio. The latter would have been a loss of massive proportions. Also the 'phone magnets were quite weak.

Thanks to those who responded and queried and apologies for my omission.

73

Reg Glanville VK2ELG,
63 Buffalo Crescent,
Thurgoona, NSW, 2640

AR

FURTHER TO WICEN PLUGS

I read with interest the WICEN News article Jan '85 and the letter from VK6RD March '85, regarding clipsal type polarised plugs and sockets. The WICEN group in VK3 HAVE been using these plugs for more than 10 years, to my knowledge.

The problem about which pin is positive and which is negative was raised long ago. Upon investigation it appeared that no standards had been set except by one two-way radio manufacturer who used these plugs extensively. The standard was that the horizontal bar of the 'T' was CHASSIS. Remember the old symbol for chassis.

(Please note that at the time there was both positive and negative earth cars).

Many other mobile radio suppliers adopted the plugs and this standard.

VK3 WICEN adopted the standard of a negative chassis as this was the most common.

The standard is:-

Horizontal Bar — Negative

Vertical Bar — Positive

To remember this remember the negative and positive sign.

If an Australian standard is developed and promulgated I am sure we would comply, in the meantime we will continue to use the above.

Colin Pomroy VK3BLE
Region 9 and 10
WICEN Co-Ordinator
PO Box 218
Churchill, Vic. 3842

AR

GOOD WISHES

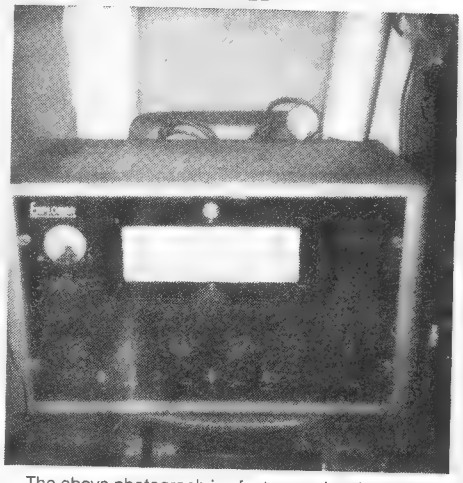
Our thoughts are with you. On behalf of the officers and directors of the Canadian Radio Relay League, our sincere good wishes to the WIA and members as you celebrate seventy-five years of service to Australian amateurs.

Personal 73.

Sincerely,
Harry MacLean VE3GRO
Secretary
The Canadian Relay League, Inc.

AR

ASSISTANCE REQUIRED



The above photograph is of a transceiver I have been given. My intention is to refurbish the rig and on first inspection it appears to be complete.

At present I am acquiring replacement valves but I have not been able to obtain a circuit diagram.

The only information on the unit is the name "Explorer" with a sticker at the top of the front panel saying "Panda Equipment". The bands covered are 80, 40, 20, 15 and 10 metres with modes of CW, FM and AM.

Hoping another member may have a circuit or some further information.

73 and yours faithfully,

Ray Barnes VK4BK,
3 Park Street,
Bayview Heights, Qld. 4870

AR

ANNIVERSARY WISHES TO THE WIA PRESIDENT

Please accept my hearty congratulations on the 75th anniversary of the Wireless Institute of Australia.

After reading "Amateur Radio" for January 1985, the first issue in the WIA's anniversary year, I became further deepened in the impression that your progress and achievements have been remarkable since the foundation in 1910. You may well be proud of being the oldest society in the world. And also it is a gratification for the IARU Region III Association to see such an old member as the WIA among us.

In particular, I, as the secretary of the Association, highly appreciate the contribution made by your society to the founding of our organization in 1968. I fully understand that, by the initiative of the WIA, the inauguration congress was convened in Sydney in 1968 and the interim Constitution was adopted. Since then, I believe your society has been one of the key promoters and has been playing a very important role in international activities in our Region and worldwide.

Meanwhile, I was pleased to receive from the WIA Secretary information on various events of the anniversary and an article on "the history of amateur radio and the WIA".

Congratulations again and I wish you and all of your members further prosperity in the future.

Yours sincerely,

Masayoshi Fujioka, JM1UXU
Secretary
IARU, Region III Association,
Box 73,
Toshima, Tokyo, 170-91, Japan.

AR

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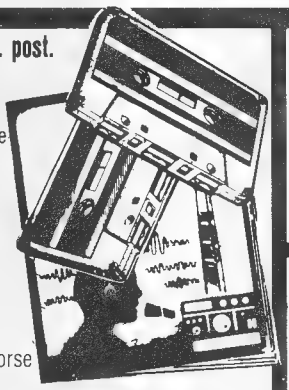

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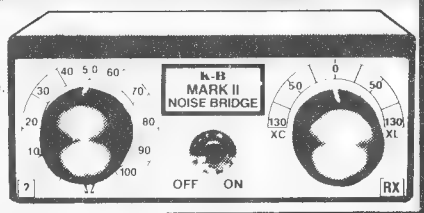

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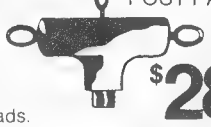

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G. SCOTT 291 Kim Avenue, East Albury, N.S.W, 2640

welcome here

AR85

Silent Keys

It is with deep regret we record the passing of —

DENYS AYRE	VK3KP
07.03.85	
R L C CREAM	VK2AFP
P GARRISON	VK4NHT
JACK GERARD	VK2ADN
04.03.85	
GLYN (MORRIE) MORRIS	VK3BZ
06.02.85	

Obituaries

PETER BERNARD DODD VK3CIF
14.10.1917 — 03.03.1985

It is my sad duty to report the untimely death of Peter Dodd VK3CIF, after a short illness.

Peter had a long history in amateur radio, travelled extensively in younger days, and was well known by DX operators throughout the world.

Peter's best known activities, as far as Australian amateurs are concerned, was his appointment to the WIA Federal Office in 1971, in the capacity of Secretary/Manager.

Peter was born in England, and moved to East Africa where he was employed by the British Colonial Civil Service. He was the Controller of Customs, and worked mainly in East African countries, Nairobi and Uganda for approximately 40 years.

He arrived in Australia with his family in late 1970 having retired from The Civil Service. He was immediately recognised for his administrative and extensive amateur radio background, and was an excellent candidate for the then newly created position within the Federal Executive.

The WIA Divisions had recognised that a central control and information flow between Divisions and members, together with centralised production of the magazine Amateur Radio, was a necessity, and Peter filled that position with excellence.

For nearly thirteen years, and with the assistance of a part-time typist, he established the solid footing which the Executive office operates under today.

On taking up the position, and in premises and circumstances which could only be described as something out of the Dickensian era, Peter moulded our system within the Institute's economic constraints to an effective force.

My first involvement with Peter was in 1971, when I became involved with the Publications Committee, then later as Editor of Amateur Radio, and finally as Federal President for a short term.

In those exhaustive years, Peter was a pillar of strength to our committee. In almost every issue with the production of Amateur Radio since 1971, Peter played an extensive role.

Little is otherwise publicly known outside of the Publications Committee and Federal Executive, of the important parts he actually did play, and in most cases voluntarily in his spare time.

I would therefore like to place on official record, albeit too late perhaps for any benefit to accrue, of my deepest gratitude to Peter for his direct assistance to me, because without it, the production of Amateur Radio magazine in those times would certainly have crumbled.

Peter was devoted to the WIA, and his mark will always be seen in the WIA portals.

In Peter's colourful amateur career, he held the following call signs, and he was an avid 10 metre DX operator:-

VK3CIF, GD3PBD, VQ4, 5 and 1PBD, G3PBD, 5H3PBD, ZD6PBD, 9J2PBD, OE1ZBW, YA1PBD and ZL1BDC.

Peter retired from the employment of the WIA on his 65th birthday in 1982. The Federal Executive, Publications Committee, Federal Technical Advisory Committee and Divisional Councillors will certainly remember him for his outstanding efforts.

If we can maintain the traditions that he established in his time with us, we will certainly progress.

Peter Dodd was also a member of three Masonic Lodges, Nairobi (Scottish Constitution), Amateur Radio Lodge (London), and England.

He served the Craft well, having being raised to a Master Mason. He held the position of Tyler when he migrated to Australia.

I extend my own personal regret, together with that of the Wireless Institute of Australia, to Peter's wife Barbara and family, in their sad loss.

Vale Peter Bernard Dodd VK3CIF
"SO MOTE IT BE"

Bruce Bathols VK3UV

JACK GERARD VK2ADN

It is sad to report the passing of Jack Gerard VK2ADN on the 4th March 1985.

Last month Amateur Radio published a Book Review of Jack's recently published book, "From Pastures Green to the Silver Screen", an autobiography of Jack's life with radio and also with the early days of "moving pictures" in Australia.

Jack's local TV station, NRTV channel 11-8, screened a tribute to Jack in their nightly news segment.

Deepest sympathy is extended to Jack's family.

Bruce Fleck VK2FS

DENYS AYRE VK3KP

Soon after 10 pm on Thursday March 7 I threw all switches to off at the station of VK3KP. The station was silent after almost half a century.

Thirty minutes earlier at the Radio Amateurs Old Timers Club (RAOTC) Denys Ayre VK3KP, aged 63, had died suddenly during the dinner.

The 57 old timers were shocked when one of their colleagues, a member of the club since its inception, had become a silent key in front of them.

Denys was typical of VKs in the 30s, resourceful, thorough, eager to talk to the world, hopefully on AM phone, and builders of their own gear. He was one of the first VKs to own the then great National HRO.

His army war service . . . he rose to the rank of Major . . . was ever in his thoughts. He recalled incidents with accuracy more than 40 years after they happened as if they had occurred the previous week. He wore the RSL badge with pride every day.

Fresh from active service, including considerable undercover work against the Japanese, Denys graduated in architecture at the University of Melbourne. He was a fellow of the Institute of Architects until his death.

This pedantic, perhaps even eccentric man of many skills was soon back on the air after graduation and went through the hectic days of the early 50s, when all bands were open, with man made noise minimal and the world could be worked around the clock on many bands.

Professional demands on his time kept him off the air for about ten years, but he returned with the sideband era, full of enthusiasm which was so typical of his make up. SSB and again the DX bug caught up with him . . . then followed VHF and UHF. He was again firing on all bands.

Only a few years ago he decided to erect a tower for a tri-band beam. That's where he hit trouble as the neighbours protested to Malvern Council. He lost. "I lost the battle, but won the war" he told many friends.

He always regretted not having a beam and had to resort to single wire antennas for the DX bands.

His shack was a credit to him, spotlessly clean, professionally laid out with easy access to everything.

Toward the end of his illustrious 48 years in amateur radio he became interested in RTTY, built most of his equipment himself and only a few days before his death made his first DX RTTY contact to JA.

He loved music and his sophisticated hi fi gear had sets of speakers in three rooms, including the shack. His favourite tune typified the man, Sinatra's smash hit . . . 'I did it my way'.

Amateur radio has lost a remarkable man in the passing of Denys Ayre, the man who spoke with authority on most subjects, the almost perfect 'expert', be it the life of Monash the engineer, the latest ARRL handbook or the bachelor on 80 metres he would speak to at 2 am when neither could sleep.

Vale, VK3KP . . . you've left your mark and set a fine example to so many. Sympathy goes to his wife of 43 years, Fay and children John and Judith.

Roth Jones, VK3BG.

VHF COMMUNICATIONS MAGAZINE

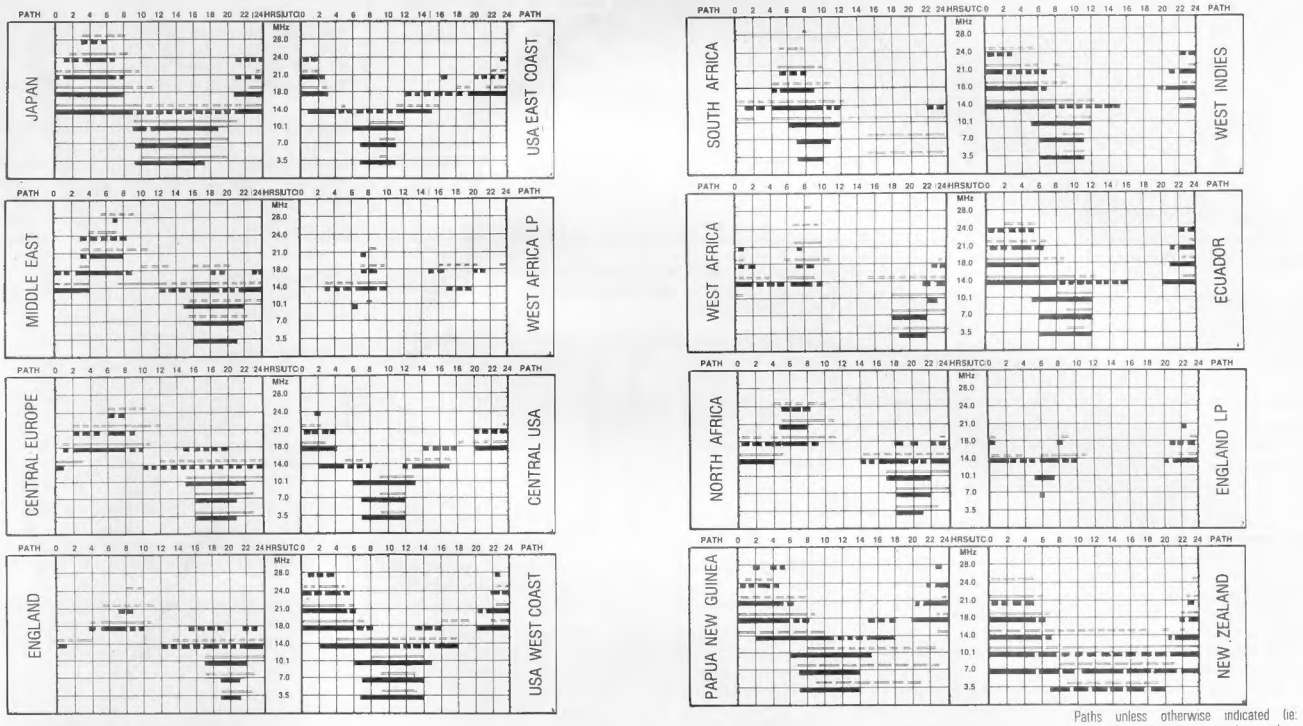
It is sad to note the tragic death of Terry D Brittan, editor and publisher of VHF Comms magazine. Terry and two of his colleagues, Franz Xaver Reichl and Klaus Wilk, passed away in tragic circumstances on 17th March 1985.

Members are advised that the staff of the magazine are continuing to produce VHF Comms, but delays may occur.

Deepest sympathy to relatives, friends and workmates.

IONOSPHERIC PREDICTIONS

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic, 3060



LEGEND

From Western Australia (Perth)

From East Australia (Canberra)

Better than 50% of the month but not every day (continuous lines)

Less than 50% of the month (short broken lines)

Mixed Mode Dependent on angle of radiation (long broken lines)

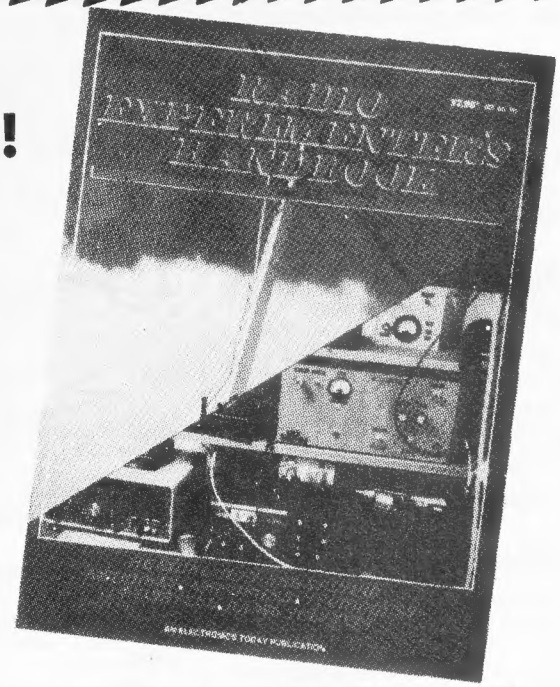
Paths unless otherwise indicated (ie: LP = long path) all paths are short path

Predictions reproduced courtesy of the Department of Science and Technology. Ionospheric Prediction Service, Sydney.

All times in UTC.

THE ONE YOU'VE BEEN WAITING FOR!

The **Radio Experimenter's Handbook,** Volume 1, from Electronics Today International is 132 pages chock-full of circuits, projects to build, antennas to erect, hints and tips. It covers the field from DX listening to building radioteletype gear, from 'twilight zone' DX to VHF power amplifiers, from building a radio FAX picture decoder to designing loaded and trap dipoles.

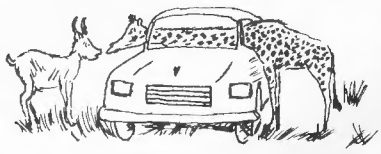


eti

Edited by Roger Harrison, VK2ZTB, this book carries a wealth of practical, down-to-earth information useful to anyone interested in the art and science of radio. $7.95 from your newsagent or through selected electronics suppliers. It is also available by mail order through **ETI Book Sales, P.O. Box 227, Waterloo NSW 2017** (please add $1.75 post and handling when ordering by mail).

AR85

NOTICE



All copy for inclusion in July 1985 Amateur Radio must arrive at Box 300, Caulfield South, 3162 no later than midday 23rd May.

HAMADS

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on separate sheets, including ALL details, eg Name, Address, on both. Please write copy for your Hamad as clearly as possible, preferably typed.*

- **Please insert STD code with phone numbers when you advertise.**
- Eight lines free to all WIA members. $9 per 10 words minimum for non-members.
- Copy in typescript please or in block letters double spaced to PO Box 300, Caulfield South 3162.
- Repeats may be charged at full rates.
- QTHR means address is correct as set out in the WIA current Call Book.

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows: The rate is $22.50 for four lines, plus $2 per line (or part thereof) minimum charge $22.50 pre-payable. Copy is required by the deadline as stated below indexes on page 1.

☐ TRADE ☐

HOLIDAY SRI LANKA. Get your 4S7 and enjoy a holiday with free call facilities. Ideal also for stopovers. Small friendly family guest house. Write to Mrs Antoinette Perera, 84 Templer Road, Mount Lavinia.

☐ WANTED — NSW ☐

AMATEURS INTERESTED IN & EQUIPPED FOR ASTRONOMY. To observe & exchange info & data with overseas amateurs on Halleys Comet. Ray VK2BAN, QTHR. Tel. (046) 84 1295.

BOOK — "Radio Transmitters" by V O Stokes. John VK2AUI, QTHR. Tel: (02) 90 2793.

RCA CR-88 RECEIVER. Also Radio Amateurs Handbooks, early 50s, late 40s. Claude VK2DLC. Tel: (02) 451 2577.

☐ WANTED — VIC ☐

BUTTERNUT MODEL HF-6V. Vertical Antenna. Price to John. Tel: (03) 583 5417.

HANDBOOK OR CIRCUIT for Heathkit SSB adapter, SB-10. Would copy & return or purchase. VK3BAV. Tel: (03) 277 1845.

SWITCHES. 8 bank, 4 or 5 position Yaxley type switch, ceramic insulation & with earthing discs, for home brew rx being built round HRO tuning unit. Willing to pay good price for right unit. W Russell VK3ZUP, RMB 7660, Wangaratta, Vic. 3677. Tel: (057) 21 8109.

☐ WANTED — QLD ☐

HANDBOOK OR CIRCUIT for HP 608E signal generator. Len VK4JZ, 33 Hill Crescent, Carina Heights, Qld, 4152. Tel: (07) 398 2002 after 6pm.

ICOM IC-22S 2m tx/rx in good condx. Barry VK4BCC, QTHR.

VERTICAL ANTENNA either Hustler or Hygain, 10-80m preferred but will settle for 10-40m. John VK4VK. 6 Tosti Street, Sorrento, Qld. 4217. Tel: (075) 38 7152 after 6pm.

☐ FOR SALE — ACT ☐

YAESU FT-107 tcrv + ext VFO & 500Hz filter. Unit in good condx. & includes desk scan mic. Offers around $700. Richard VK1UE, QTHR. Tel: (062) 58 1228.

☐ FOR SALE — NSW ☐

ANTENNA — RAK Trap dipole for 80-40m. $30. Icom IC-720A. Ex condx. with SM-5 desk mic. $800. VK2JN. Tel: (02) 449 4324.

HOME BREW HF LINEAR AMP. 2*813 with spare tubes & P/S. P/S needs repair, $300. VK2AWR. Tel: (02) 665 1082 evenings & weekends.

KENWOOD TL-922 AMPLIFIER. 2/3-500Zs, manuals. New condx. $1550. Icom 290H all mode tcvr. Manual. $450. Keyer Katsumi EK-150, new, $135. Manual, Millen-Craywood dual section capacitors. 16250-255pF, 3kV, new. $100 pair. Rotary inductor, new, ceramic, 28μH. $60 for transmatch ATU. 4/25A — PL 5D-22 tube. New interchange with 3,500Z in GG amplifier. $65. Tel: (02) 918 3835.

KENWOOD TR-2400 with base stand & mic. Prefer part exchange HF tx with cash adjustment or best offer. Bill VK2BDW, QTHR. Tel: (02) 674 1184.

KENWOOD TR-2500 h/held FM tcvr, complete with leather case, hel ant, 240V charger, h'book, $295 ONO. Access also avail. Kenwood TM-201A compact 2m FM 25W mobile tcvr complete with hand mic., MC-55 boom mic. SP-50 mobile spkr, h'book. $315 ONO. Laurie VK2AQW, QTHR. Tel: (02) 969 2160.

KENWOOD TS-520 tcvr fitted with additional 500Hz CW filter type YG-3395C, + Kenwood remote VFO-520. Both one owner & in VGC. Complete with h'books for both units & orig. packing. $550. VK2BFJ, QTHR. Tel: (043) 32 5758 (Central Coast).

KENWOOD TS-520S with VFO-520 remote VFO & mic. Good condx, operating & service manuals. $500 ONO. VK2ATK, QTHR. Tel: (02) 80 4000.

KENWOOD TS-530S. WARC bands. Immaculate condx. $600 ONO. Swan linear amp 1200-Z, 1kW PEP, 600W CW. Ex condx, 2 spare tubes. $450 ONO. Antenna tuning unit, homebrew. Used with 1200-Z, rotary inductor. $75 ONO. Hi Mound hand key $20. Yaesu mic. Imp 50kohms. $10. Vicki VK2EVM, QTHR. Tel: (063) 68 2137.

KENWOOD TR-7600 2m FM tcvr. Complete with mic, mobile bracket & 2x1/4 wave mobile antenna. $175. Icom SM-2 desk mic, unused, $30. Stromberg-Carlson type 5V75 rx. Collectors item. Free. Peter VK2DEH, QTHR. Tel: (02) 452 4302.

TOKYO HY-POWER 45W, 70cm amp. Includes preamp, $190. Icom IC-AG1 70cm masthead, GaAsFET preamp, $60. John VK2DFC, QTHR. Tel: (069) 62 5547.

YAESU FT-101 tcvr with mic & h'book, $395. Stan VK2BKS. Tel: (042) 28 5041.

YAESU FT-107DM tcvr. All WARC bands, mic, phones, service manual. Good condx. $800. George VK2YT. Tel: (02) 724 5276.

YAESU FT-480R 2m all mode tcvr. 25W out in ex condx with instr manual & 5/8 mobile whip & base to suit & mobile bracket. $495 ONO. Tel: (02) 636 9205.

☐ FOR SALE — VIC ☐

ANTENNA TUNING UNIT. MFJ-941C as new. 10-160m rated 300W o/put. $80. VK3AMC, QTHR. Tel: (03) 592 9036.

COIL BOXES. 3 for AMR-100 rx. Made by AWA. $5 each. VK3BAV. Tel: (03) 277 1845.

ICOM IC-02A. 2m h'held synthesised tcvr with AC & DC chargers. Ext spkr, mic. leather case & 12V cig lighter lead. Yaesu FT-7 in good condx. Yaesu FL-110, 100W HF amp. Ex condx. Andy VK3DTO. Tel: (03) 417 5897 BH or (053) 48 3003 AH.

ICOM IC-502 6m SSB/CW tcvr. Good condx with h'book but no mic. $100. David VK3ANP, QTHR. Tel: (057) 27 6218.

ICF-2001 SONY HF digi scan rx. 0-30MHz. As new, comp. with h'book, power supply & straps. $220 ONO. Jonathon VK3PRN. Tel: (03) 20 7520 AH.

KATSUMI EK-26 ELECTRONIC KEYER. $50 with instr book. Omega model TE-701 ant noise bridge $10. Trio VT-108 FET volt/ohm meter cable & instr book. $45. Kyoritsu SWR bridge K-109. $25. Tel: (052) 52 1608.

KENWOOD LINEAR AMP, type TL-120, input 10W, output 100W, match unit for TS-120V. As new condx with operating manual & leads. $175. Ken product RF speech processor, type KP-12, uses xtal filter provides 10dB signal increase. 240V AC operation. Ex condx, complete with leads & instr manual. $40. VK3CCE. Tel: (03) 509 1720.

OSCILLOSCOPE. BWD 5" Model 504. Good condx, complete with leads & h'book, $110 ONO. Alan VK3DRN. Tel: (03) 20 5454 AH.

RTTY EQUIPMENT. Model 15 teletype with cover & all keys intact. 240/115V AC tfrmr, EA mod/demod, circuit & op. instr. Not used for over 12 mths. Good condx, may need a clean & retune. Can demonstrate. Ideal newcomer to learn this mode. $120. HF beam, 10m, 3el, new. Unused, still in box. $50. B Bathols VK3UV, QTHR. Tel: (03) 580 6424.

SHACK CLEAN-OUT. Ham-M rotator with Ham II controller. $75. Ham II rotator with controller, $95. Heathkit model SB-610 monitorscope $60. Rapar model MV-21 VTVM $30. John VK3JF. Tel: (03) 583 5417.

REGENCY M-400 SCANNER. $350. FT-207 h'held tcvr. $300. FT-7 HF tcvr $300. Realistic Patrolman VHF radio, $50. Alinco 2m, 3W in, 30W out. Power amp, SSB & FM, $60. Stan VK3BNJ. Tel: (03) 743 6708.

☐ FOR SALE — QLD ☐

KENWOOD TS-120V in VGC. Fully legal novice power from 10-80m. Includes MC-35S mic. $450 ONO. Tel: (070) 53 2380 AH.

KENWOOD TS-430S with FM module/mike/manual. $1050. TS-520S with mic/manual ctn. $395. Collins KWM-2 with match 30LI. 1kW linear amp $995. Offers considered. VK4VNN. Tel: (071) 98 2282.

KENWOOD TS-520S tcvr, MC-50 mic, DC-DC conv, manual. $475. Yaesu FT-277RB. 10W, 2m tcvr. Scan, 4 mems, manual. $250. 6m, 5el H/B yagi $20. Charlie VK4BMB. Tel: (074) 22 2337.

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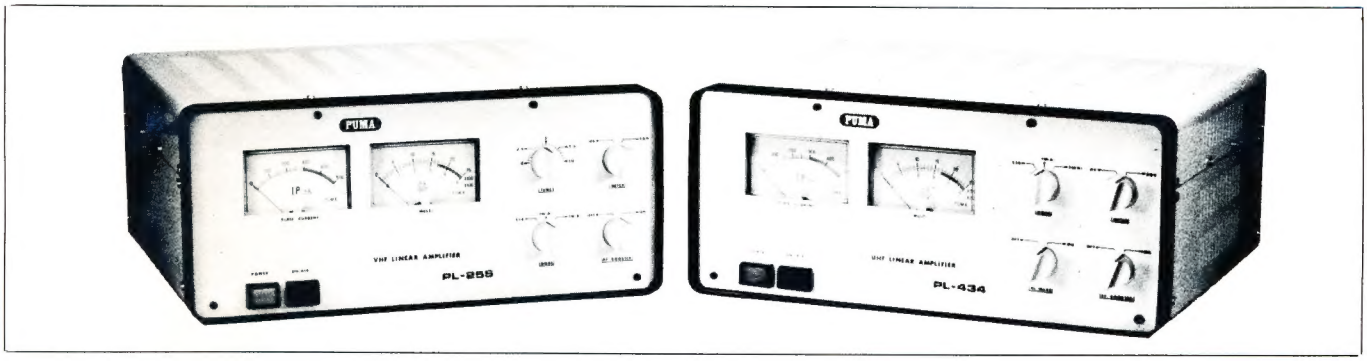
PL-25SG, PL-434G — VHF-UHF Linear Amplifier



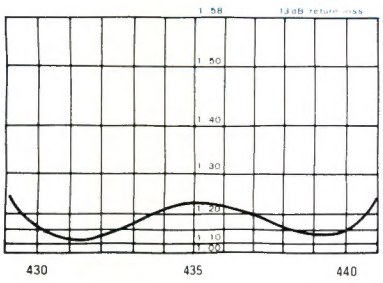
	PL-25SG	PL-434G
Circuit	Class AB$_1$ GK	
Frequency	144 ~ 148 MHz	430 ~ 440 MHz
Input Power	600 W	500 W
Plate Voltage	2000V	
Output Power	300W	250W
Mode	SSB, FM	
Drive Power	Under 10W	
Input Impedance	50Ω	
Output Impedance	50 ~ 75Ω	
Cooling System	Sirocco Fan	
Power Requirements	240V 3A	240V 3A
Dimensions	(D)310 x (W)340 x (H)155 mm	
Weight	17.5 kg	
Tube Complement	EIMAC 4X150A (7034)	EIMAC 4CX250B(7203)

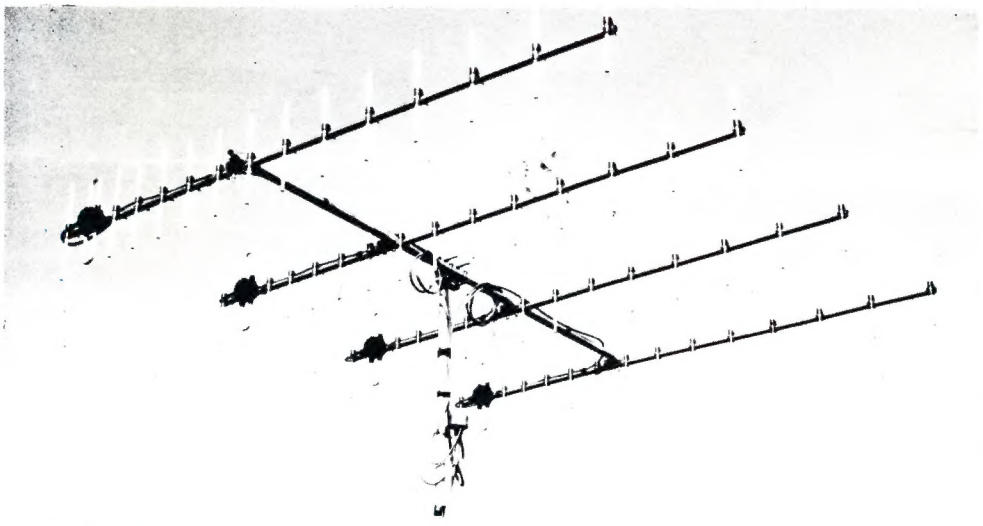
Accessories: RF Amplifier included (PL-25R, PL-434R)

GY-715Q

GY-715Q
20.0 dBi

GY-715Q





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NEW 2m FM HANDHELDS from YAESU

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FT203R

2.5 watt
144-148 MHz

VOX operation with optional YH-2 Headset.

Thumbwheel Channel Selection.

PA-3 DC/DC Car Adapter/Trickle Charger (option)

FT209R

3.5 watt/350 mW

FT209RH

5 watt/500 mW

Microprocessor controlled

10 Memories

Reverse Repeater

Power Saver to extend battery life

VOX operation with optional YH-2 Headset

PA-3 DC/DC Car Adapter/Trickle Charger (option)

The HF Allmode Transceiver you have been waiting for — from **YAESU**

FT-757GX

100 watts Output PEP/DC — 25 watts AM Carrier — 13.4 volts DC (19 amps for 100 watts output) — Weight 4.5 kg

FEATURES:

- *Dual VFOs and eight memories*
- *Programmable Memory Scanning*
- *SSB AM-FM Modes Standard*
- *Squelch on all Modes*
- *Full Break-in CW*
- *Accessories installed include 600Hz CW Filter, iambic keyer with dot-dash memory, marker, IF shift and width. N.B. (only option is CAT interface to extended computer control)*
- *High performance General Coverage Receiver*

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